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AUGUST CONTENTS

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ORTHODIAGRAPHY

Renewed interest in an old method promises to make the X-ray as indispensable an aid in the diagnosis, prognosis and control of certain circulatory diseases as it has been for some years in the investigation of gastro-intestinal disorders. The French school of radiologists, represented especially by Vaquez and Bordet[1] of the Faculty at Paris, have succeeded by elaboration of the orthodiagraphic method in elevating the orothodiagraph to the dignity of a clinical instrument of precision.

Orthodiagraphy has been for long neglected in this country; it has a technique which requires care and precision to make its results valuable, and the shortcut of teleradiography has appealed to most American radiologists as an easier, if a far less efficient, method of approach in cardiac diagnosis.

Orthodiagraphy is the use of the central ray of the X-ray bundle to project accurately upon the fluorescent screen the exact size and outline of any object opaque to it. It is obvious that in deducing the size of an object from the size of its shadow, whether that shadow be cast by ordinary light or by the X-Ray, that the pencil of rays projecting the shadow must be parallel in order to avoid distortion and magnification. The method of obtaining the central rays of an X-Ray bundle is comparatively simple and the recording of the shadows cast by them is a matter of painstaking care, rather than of highly developed skill. Teleradiography aims to achieve this result by removing the tube so far from the patient that the rays as they strike him are practically parallel, and hence cast shadows similar in size and shape to the objects which lie in their path. The method is unfortunately limited to plates taken in the routine antero-posterior position and does not lend itself to procuring tracings at any angle and while the patient is under easy and continuous observation as does the orthodiagraphic screen technique.

Vaquez and Bordet, in their two monographic studies of the heart and the great vessels at its base, and using the orthodiagraph as their method of approach, have more than laid the foundation for a new advance upon the problems of the clinical pathology of the central circulatory apparatus. They are able, among other things, to demonstrate an early ventricular hypertrophy by a simple calculation based on orthodiagraphic findings long before ordinary clinical methods could hope to detect it. They have shown the comparative ease with which the dilatation of a single chamber, the left auricle for instance, can be determined positively by tracings made in the oblique positions; findings necessarily of extreme value and suggestiveness when there is a question of early organic pathology in the heart. The method is of no less value in determining the nature and observing the progress of lesions of the aorta. Aside from the accurate mensuration which it makes possible, it facilitates the differential diagnosis between the various inflammatory and degenerative changes that are liable to attack the coats of that vessel.

Vaquez and Bordet have introduced to the clinical world a method which, in skillful hands and properly controlled, may take rank with such sacrosanct instruments as the internist's fingers and his stethoscope as aids and illuminants on the sometimes dark and dubious road of cardiac diagnosis.

[1] Le Coeur et l'Aorte and Radiologie des Vaisseaux de la Base du Coeur, by H. Vanquez et E. Bordet. Published by J. B. Bailliere et Fils, Paris.

EXTENSION WORK OF THE STATE MEDICAL SOCIETY

Some two years ago the Council of the State Medical Society authorized the establishment of an extension course of lectures. After very considerable effort the secretary was able to distribute throughout the State a list of special topics, with capable lecturers, which was made available to such constituent societies as desired to ask for it. A number of county societies have availed themselves of this opportunity and have had a number of lectures.

The Council feels that the results have been encouraging enough to further elaborate the extension work. The secretary's office is now preparing a list of subjects and lecturers who will be available for any county society upon appropriate invitation. In order that this list may be as complete as possible, all members of the society and all county societies who are interested in contributing to this program are requested to submit to the secretary's office before September a list of subjects with speakers who will be available upon invitation to go to any county society or any other meeting when asked to do so. Shortly after September first the subjects and speakers will be arranged in some convenient manner, published and submitted to every society in the State.

Secretaries of county societies are requested to bring this matter before one of their meetings and let the State secretary have a report of the county society's wishes.

GROUP MEDICINE

The idea of closer working alliance between groups of medical men has been much discussed by physicians and surgeons and specialists. It appeals to many, while others seem to see in it a possible influence tending toward commercialism and a greater misunderstanding between medical men than obtains today. All will agree that the advances in medicine have been so great that no one mind can master it in all of its details. A group of men concentrating their energies on different fields of medical knowledge and research can do more for the patient in many cases than can one mind, be it ever so versatile. If medical men choose to group themselves together in a united effort, they are only doing what other men have considered it necessary to do in other occupations. The idea of group practice is not as new as perhaps it may seem. Since the days of hospital organization, medical men have worked in groups, to the advantage of the public and themselves. If group practice is to be a permanent arrangement, it must be conducted on approved principles. The men outside the group in particular must be given help. In the smaller towns and in rural districts group medicine might make better laboratory facilities and better hospitals possible with less outlay of time and energy. It also has a bearing on State medicine. The best way to avoid State medicine is for the profession, by organization, to anticipate it, and group medicine is worthy of consideration in this connection. State medicine might not prove more satisfactory than State railroading.—(Abstract of editorial in Canadian Medical Association Journal, May, 1921.)

ETHICS OF ADVERTISING

The history of advertising by members of the medical profession is interesting. In early days it was the most advertised of all professions or vocations; in fact, medical men were leaders in methods of advertising and in the thoroughness with which these methods were followed up. Later there came a great reaction against public methods of personal publicity, and the profession went to the other extreme and did not permit advertising by any of the usual means employed by other professions and vocations. Neither of these extremes has proved satisfactory to the profession or to the public.

The restrictiveness of our ethics as they have stood for a long time is responsible for a variety of methods of personal promotion, some of which are of uncertain propriety and of questionable value to the man himself. The pendulum has again begun to swing away from the exclusiveness in publicity.

It probably is true, as it undoubtedly should be, that public advertising in lay periodicals and by circulars and other methods used in commerce never will be permitted by our profession. Certainly there ought to be an intermediate ground somewhere that would permit dignified ethical representation by institutions, organizations, groups and individual physicians to make their qualifications known to people who may desire their services.

It is interesting in this connection to call attention to the following resolution passed unanimously by the Council of the State Medical Society at their last meeting in Coronado:

> "It was unanimously agreed that, in the opinion of the Council, the insertion of appropriately worded cards by physicians and other professional men in the advertising columns of the Journal is ethical, permissible and should be encouraged."

SILVER ARSPHENAMINE

It seems, from a review of the literature, that in silver arsphenamine we have a more potent spirocheticide than any heretofore in use and one which should be used with the greatest care; it seems to represent a real therapeutic advance. It is presumed that the silver, for which spirochetes have a special affinity, serves as an anchor for the arsenic, and that therefore the drug, despite its lower arsenic content than arsphenamine, is more active therapeutically. Animal experimentation seems to show that silver salvarsan, as it is called, is twice as effective as the old salvarsan and three times as effective as neosalvarsan.

The use of this silver-arsenic preparation seems, from the reports, to be attended with more danger than the older preparation. This danger is reflected in the dosages used, i. e., from 0.02 to a maximum of 0.25, in dilute solution. Anaphylactoid symptoms—redness and swelling of the face and buccal mucous membrane—pyrexia; cutaneous eruptions which are usually transient, and occasionally severe dermatitis; syncope, collapse, vomiting, vertigo and headache; and icterus are all listed as secondary effects.

The most recent reports on this drug are based upon the experience of Major Walson of the Army, who treated 800 patients and gave more than 6000 injections. The method of treatment recommended by the board of medical officers of the Army and that method used by Walson is as follows:

An interval of seven days between each dose in each course of treatment. Treatment to consist of four courses of silver salvarsan and gray oil.

In the first course of treatment the first dose to be fifteen-hundredths (0.15) gm. of the drug. The second dose to be two-tenths (0.2) gm., and each of the remaining five doses of the course to be three-tenths (0.3) gm. of the drug.

At the end of the first course of treatment a Wassermann blood test is made, and then thirty days' rest.

In the second course of treatment three-tenths (0.3) gm. of the drug is given at each of seven injections, at seven day intervals, and is followed by two and one-half months' rest.

The third and fourth courses are the same as the second, with ninety days' interval between the two. Gray oil is used in conjunction with and at the same time as each injection of silver salvarsan, using eight-hundredths (0.08) gm., by intramuscular injection.

A blood Wassermann is recommended after each course, and a spinal fluid Wassermann after the second.—(Abstract from an editorial in the Journal of Laboratory and Clinical Medicine, June, 1921.)

INFANTILE PARALYSIS INCREASING

Doctor Hassler, of the San Francisco Health Department, has requested the Journal to call the attention of physicians to the increase of infantile paralysis. During the last two weeks ten cases have been reported in San Francisco, which is an increased rate over any year since the epidemic of 1917.

The Health Department considers it is safe to assume that a number of missed cases, or so-called abortive cases, exist for each developing paralysis that is reported.

With two or three months of climatic conditions favorable for the spread of this disease before us, there is danger of an epidemic of this disease, which we should not only foresee but forestall, if possible. This may be done with the assistance and co-operation of the medical profession.

There are abortive forms of the disease in which paralysis does not develop. These constitute the greatest menace in the spread of the infection, as these are the most difficult of diagnosis. The syndrome of fever, drowsiness, pain and sore throat, are very suspicious symptoms in children, and patients suffering from these symptoms should receive the special care of physicians at this time. The contact relations of sick children should be studied with special care.

The physician often is not aware of all these relations in the practice of other physicians. Therefore, prompt report to the Health Department will be of assistance to the physician and the public.

Early diagnosis and early report to the health offices is most important, and prophylactic precautions to prevent the spread of this disease should be practiced.

Infection is spread from person to person by secretions of the nose and throat of patients and carriers. It is claimed that dust and the stable fly carry the infection; therefore, all patients showing an otherwise unaccountable fever with drowsiness, pain and sore throat should be reported and the patient isolated in rooms screened against flies.

STREET VENDERS OF NOSTRUMS—The Board of Health of San Francisco, at a meeting held on July 21, 1921, passed the following resolution:

"Resolved, that the Board of Health place itself on record as being opposed to the issuance of licenses to anyone peddling medicines of any sort on the public streets, as such practice is a menace to public health; and, further, that the Health Officers be directed to refuse to issue permits for the vending of all medical nostrums and products on the public streets."

Original Articles

EPIDEMIC ENCEPHALITIS.*

By HERBERT C. MOFFITT, M. D., San Francisco.

Our interest in world-wide epidemics has been rudely awakened by the events of the last five years. In 1916, chiefly in New York and neighboring states, came a wave of poliomyelitis bringing with it at the crest unusual cases and high mortality. During 1917, culminating in the camps in winter and in the spring of 1918, respiratory infections succeeded each other in well marked periods or developed together during several weeks, possibly enhancing the virulence one of the other, and running clinical courses of severe and unusual types. Epidemic meningitis, pneumococcus and streptococcus infections were dangerous additions to the more usual camp scourges of mumps and measles. Later in 1918 rolled in the tidal wave of influenza from Europe, swamping the country in its initial strength and spreading rapidly from east to west. Possibly (as would appear from certain records in the Letterman Hospital) even before this wave reached us a smaller one, coming in the other direction and much modified by the long course across the Pacific, had broken on our shores. During the last three months of 1918 230,845 cases of influenza were reported in California, in 1919 82,682, in 1920 66,183 and a smaller wave is even now in the past month well raised above the average level of six months ago.

In 1917 and 1918 all these great infections were with us curiously pneumotropic although, starting about this time in central Europe, another infection with decided neurotropism was spreading gradually, and gathering strength to break in the epidemic waves of 1918, 1919 and 1920; we are again witnessing the association of the "catarrhal" with the "nervous fevers" that has been noted in cycles through more than 400 years. Those particularly interested in various types of encephalitis and its epidemiology should read the interesting historical paper of Crookshank, the older articles of Leichtenstern, Oppenheim, Mauthner, Church, Comby and Longuet, as well as numberless papers, reviews and even monographs which have appeared since Von Economo's report of cases of lethargic encephalitis in Vienna in 1917.

Incidence: The incidence of the disease has undoubtedly everywhere been much underrated, many early cases being unrecognized or miscalled botulism, meningitis or influenza. Early in 1918 cases were reported in France and in March and April, 1918, in England; it seems probable that the "mysterious disease" of 1917 in Queensland and New South Wales reported by Cleland and Campbell should be classified with epidemic encephalitis, and the cases described by Breuil in Australia (Medical Journal Australia, March, 1918) clinically could be so grouped though pathologically nearer to poliomyelitis. The ultimate classification of the entity described by Bradford, Bashford and Wilson under the heading "Acute

* Read before the Fiftieth Annual Meeting of the Medical Society of the State of California, Coronado, May, 1921.

Infective Polyneuritis" is more doubtful. Five hundred and thirty-five cases were reported in England and Wales in 1919 and 202 cases in the first three months of 1920. Roger, from a survey in France, estimates that at least 10,000 cases occurred in 1920. To June, 1920, 3960 cases had been reported in Italy with 1013 deaths (25.6%). The first case in New York was reported September 4, 1918. In New York City 128 cases with 33 deaths were reported in 1919; 565 cases with 211 deaths in 1920; 61 cases in January and 195 in February, 1921. The U. S. Public Health Report of February 11, 1921, analyzes 222 of 225 cases reported in the United States between September 18, 1918, and May 19, 1919; 39 of these were excluded on account of faulty diagnosis; 46% of 122 cases had recently had influenza; no evidence of direct contagion was noted. It is plainly evident that statistical study of the disease except from carefully kept hospital or private records is of little value. No cases were reported in this state for 1918, 78 in 1919 and 76 in 1920. Up to April 1, 1921, the cases reported in the state at large number 170, in San Francisco 59. Many of my cases figure in these totals, others have not been reported because seen in consultation or in chronic stages of the disease.

Etiology: Loewe, Strauss and Hirschfeld of New York were the first to demonstrate that emulsions of the nervous system from fatal cases might transmit the disease to rabbits and monkeys. Their results have been confirmed by Thalhimer in this country, by Levaditi and Harvier in France, by Ottolenghi, D'Antona and Tonietti, Maggiore and Sindoni, Micheli in Italy. It has been fairly established by the same investigators that the virus is a filterable one, that it exists in the nasopharyngeal secretions, that it may be preserved for long periods in glycerin, that its virulence may be enhanced by rapid stepping-up through a series of rabbits, or may be decreased by drying, by treating with phenol or other chemicals. Harvier describes a certain fixed virulence after passage through several rabbits with symptoms occurring regularly in four to six days. On the other hand, Harvier and Levaditi have noted incubation periods of three or four weeks from material of chronic cases ending fatally after five or more months. Thalhimer has had rabbits survive for ten weeks after inoculation. Guinea pigs or mice may be used experimentally as well as rabbits. Infection occurs not only from intracranial injection of filtered emulsions, but from intraneural, intranasal, intraocular, intratesticular as well. Loewe and Strauss have emphasized the diagnostic value of injections of the filtered nasopharyngeal washings and of spinal fluid intracranially into rabbits. They have reported a minute filterable organism grown from the brain, nasopharynx, spinal fluid, and blood in man and from the brains of infected rabbits. Thalhimer has confirmed their results, but Levaditi and Harvier have been unable to do so.

The method of intracranial injection of spinal fluid or nasopharyngeal washings into rabbits as described by Loewe and Strauss is quite simple. In two of my cases material from the nasopharynx was used, in two others spinal fluid as well. In one case nasopharyngeal washings after filtration were injected into a monkey's brain by Dr. Carl Meyer. All the experiments were negative.

Surprisingly few instances of contagion have been demonstrated in man. Guillian and Lechelle cite one, Halle one, Claude and Laulerie two. No instances were observed in 122 cases analyzed by Smith. (Public Health Report February 11, 1921. 36:207.) Netter thinks that natural immunity must be high and that only individuals with substandard nervous systems are liable to be attacked. Lepine writes that in all of his fifty cases there were predisposing factors that might render the nervous system less restraint. Of my forty-eight cases, fifteen had had influenza in 1918 or 1919, two women had outspoken exopthalmic goitre; there was evidence of cerebrospinal syphilis in three men. Other histories of interest may be grouped as follows:

Unconscious from falls within a year, 2.
Repeated syncope, 1.
Familial tremor, 1.
Two attacks of facial paralysis, 1.
Previous chorea, 1.
Marked nervousness for years, 5.
Recent mental strain and surmenage, 3.

Fifteen of my cases were women, thirty-three men; the greater frequency of the disease in men has been recorded by a number of observers.

Pathology: A merchant of 34 had been nervous for years with frequent headaches, occasional pain in left arm, restless sleep with sudden sleep starts. Beginning January 31, 1919, he was ill three days in Chicago with cough, fever and mild delirium at night. He then returned home and was apparently well till February 22, when he felt feverish and sweated profusely. Headache then began and persisted in moderate intensity. February 26, occasional sharp pains began to shoot down the left arm like electric shocks and on the 28th intense burning pain became localized in the left index finger. This pain dominated his whole actions for the next two days, prevented rest, was not relieved by hypodermics of morphin, nothing could be found to explain it when suddenly it disappeared and was replaced by myoclonic jerkings of the left hand, arm, shoulder muscles. The patient became more restless and delirious, temperature was never over 99.6 degrees, reflexes were unmodified, eyegrounds unchanged, blood count normal, spinal fluid not under pressure with negative Wasserman, globulin slightly increased and 11 lymphocytes per cmm. March 4 myoclonus was persistent in the left arm and spread to the left abdominal and trunk muscles with hiccough due apparently to contraction of the left half of the diaphragm alone. Profuse sweating was seen on the left side of the face and neck without other evidence of sympathetic involvement. March 5 stupor replaced restlessness and delirium, respiration became irregular and the pulse, which had been from 90 to 96, rose to 120; death occurred suddenly early on March 6. No paralysis of eye muscles was noted at any time.

Autopsy by Dr. Rusk showed slight enlargement of the spleen and mesenteric glands. There were

no changes in the meninges or in cerebral arteries; there was no brain edema. Macroscopically sections of cerebral hemispheres, cortex, basal ganglia, pons, medulla and upper cord showed nothing abnormal. Microscopically there was typical perivascular lymphocytic infiltration scattered through basal ganglia and particularly marked in the brain stem. There were very few small hemorrhages. The cord was unfortunately not secured.

A woman, 35, entered the University Hospital April 23, 1919, with full-term pregnancy and complaining of pains and jerkings in both arms. She was delivered April 30 of a healthy child. Slight temperature followed delivery and was referred to thrombophlebitis of the left femoral vein. Mild delirium after a few days gave place to apathy and lethargy. May 10, ptosis, diplopia, masseter weakness, palsy of the right facial nerve were noted. There was a positive Babinski on the right. Spinal fluid showed a negative Wasserman, positive globulin, reduction of Fehling and 26 lymphocytes per cmm. Gradual improvement took place, apathy lessened, myoclonus ceased. Facial, masseter and eye muscle palsies disappeared, convalescence was apparently established when suddenly May 26 death occurred from pulmonary embolism.

Autopsy was done soon after death and showed the source of the pulmonary emboli to be in the deep leg veins. The brain superficially was normal, but the gray matter on section was pinker than normal. There were a few tiny hemorrhagic spots in the brain stem. Microscopically there were numerous small hemorrhages and numerous areas of marked lymphocytic infiltration along the small veins of basal ganglia, brain stem and pons.

August 29, 1920, a man 44 years of age was seen with Doctor Jacobs. When much overweight ten years ago he had had several attacks of syncope without obvious reason. Early in July sudden diplopia, due to paralysis of the right inferior rectus, came on without any other symptoms or signs. There was no history of syphilis and the blood Wasserman was negative, but specific treatment was given and the diplopia gradually got better. Ten intramuscular injections of mercury benzoate were given, followed August 19 by intravenous injection of neoarsphenamin .3, which was repeated August 26. Malaise and temperature of 101 degrees followed the last injection. On the 28th he was thoroughly examined by Doctors Shiels and Jacobs and nothing noted except slight diminution of the knee jerks. On the 29th at 3 p. m. he had pain in the right arm, followed at once by a chill and severe general convulsions; at 8 p. m. a second convulsion was succeeded by deep stupor. He was examined soon after and found to have no paralysis, no rigidity, knee jerks, Achilles rebexes were absent, but there was a positive Babinski on both sides. The eye grounds were negative, leucocytes 13,000, with normal differential. Spinal fluid was clear, not under pressure, contained no cells, gave a negative Wassermann and Lange and a positive Nonne and Naguchi. The urine, which had been normal on the 28th, contained on the 30th a large trace of albumen and numerous hyalin and granular casts. Coma persisted and death occurred on August 31. Autopsy by Dr. Ophuls showed the skull cap thick, heavy and congested, the dura normal, the piaarachnoid markedly congested. Numerous punctate hemorrhages dotted the cut surface of the brain sections, especially in the white substance. They were most numerous in the occipital lobes, corpus callosum and beneath the aqueduct of Sylvius and the fourth ventricle. Microscopical sections of various parts of the cortex showed extreme engorgement of the small veins and capillaries and a few small hemorrhages. The pia was not thickened. In sections of the corpus callosum and various parts of the brain stem there were many large perivascular hemorrhages, but no areas of round celled infiltration. As there was no positive evidence of syphilis in this case a clinical diagnosis of encephalitis was made, the possibility of arsphenamin encephalitis was raised but not considered probable. The autopsy findings were those of hemorrhagic rather than epidemic encephalitis. Careful systematic examination of the brain sections from the above cases will come later.

Marinesco, Wilson, Buzzard, Marie and Lhermitte, Bassoe, Wegeforth and Ayer have given excellent descriptions of the pathological changes. In general it may be stated that:

1. Lymphatic perivascular infiltration and small hemorrhages are the dominant lesions. The entire nervous system may be involved, but there is an undoubted predilection for the brain stem.
2. Piaarachnoid infiltration is less marked than in poliomyelitis or in general paralysis.
3. Destructive and degenerative parenchymatous changes are not nearly as extensive as in poliomyelitis. Extensive hemorrhages and large areas of softening are not usual, not nearly so common as in the hemorrhagic type of encephalitis that followed the influenza epidemic of 1889-90. And, yet as good observers as Mauthner and Leichtenstern could see no essential constant pathological differences between the so-called "influenzal" encephalitis and nona of that period.

The wide dissemination of the lesions in the nervous system, the rarity of extensive parenchymatous destruction, the shifting character of the vascular and perivascular changes, of ganglia degenerations and glia proliferation, the concentration of the virus at one time in one part of brain or cord and later in another will account for the variability of clinical pictures and the shifting scenes at various periods of the disease. In view of scattered reports that are appearing of autopsies on chronic cases it seems probable that the virus is capable of long viability and that fresh lesions may be excited in the region first attached or that entirely new areas may be invaded. Late symptoms are not necessarily the result of slowly progressing degenerations, therefore, but often the expression of a recrudescence of the disease. Von Economo followed one of his early cases eighteen

months, during which the clinical picture often changed. Death occurred after an acute exacerbation with marked dysphagia and autopsy showed old lesions in the brain stem with a recent involvement of the area about the glossopharyngeal nucleii. Archard and Foix, in describing the pathology of five cases, picture the manifest activity of a lesion found in a case of seven months' duration in which death occurred suddenly when the patient was apparently doing well.

Lesions outside the nervous system are rarely found at autopsy, which explains how little help the clinician can expect in diagnosis except from an analysis of the nervous symptoms. Two cases of Bassoe showed extensive petechiae in pleura, pericardium, bladder and stomach. Hemorrhagic blebs have been noted occasionally over heels, buttocks and backs, and bedsores as well. One of my patients finally died from septicemia resulting from excoriations of his skin from constant picking and scratching. Enlargement of the spleen is inconstant; swelling of the submaxillary and parotid glands has been described in a few instances.

Symptomatology: As is usual in world-wide epidemics, the first waves bring the most severe and the most typical cases. In the next years the clinical picture is less typical, or we learn to recognize more readily fruste forms that were overlooked at first. Unlike many infectious diseases the prodromal and general symptoms offer little help in diagnosis. The clinical charts of acute cases show no typical curves of temperature, pulse and respiration. As a rule there is slight temperature even in slowly developing cases. Hyperthermia I have seen only in cases with pontine localization or with terminal bronchopneumonia, but from other reports this is not always so. In a case fatal after twelve days' illness temperature never rose above 99.6. Pulse rates over 120 and very slow and irregular respiration, I have again only happened to see when pons and medulla nucleii were definitely involved. I have seen labial herpes three times, indefinite erythematous rashes on several occasions, but there are no characteristic skin changes; purpura and mucous membrane hemorrhages have been reported, but they must be extremely rare. The spleen has not been palpable in any of my cases. There are no cardiac lesions even in the pronounced choreiform types, and no pulmonary signs except in cases with terminal pneumonia. Netter and other French observers have noted enlargement of the salivary glands. Merklen has described an onset with arthritis and in one of Dr. P. K. Brown's observations pains in the joints followed soon on inaugural pains in the hands, arms and back. Claud has described swelling of tendon sheaths as well as joints. In Dunn and Heagey's analysis of 115 cases nosebleed was noted twice and I have seen it in one case. The essential lack of general symptoms in most cases is in strong contrast to other infections with early pronounced nervous symptoms—such as epidemic meningitis, tubercular meningitis, pneumonia, typhoid and is of great help in diagnosis. The patient looks too well, eats too well, has too clean a tongue, too low a temperature to have his delirium, stupor or many focal signs explained by one of the above diseases.

The most typical forms of epidemic encephalitis are slowly ushered in by indefinite malaise, moderate headache, constipation, a little fever and disturbance of vision, either blurring or distinct diplopia. At this stage there may be insomnia and decided restlessness with mild delirium or ephemeral disorientation either day or night. More characteristic is an increasing listlessness, lack of interest, apathy, asthenia which often deepens into the lethargy or stupor which has given its name to the disease. This mental indifference is accompanied with a striking loss of muscular tone and expression, or even more remarkable, with a decided increase of muscular tonus and rigidity. The masks of Parkinson or Hutchinson cover the former lively facial expression. Slow speech, some difficulty in swallowing occurs. In most severe cases the patient lies frozen in certain attitudes in bed and may say that he feels his body no longer belongs to him or obeys his will as before. In one young girl during this stage, speech was wholly inhibited, no voluntary movements, even chewing, could be executed and the extremities when placed in bizarre position would be held long by catatonic rigidity. Retention of urine is not unusual. Irregular coarse tremor and attacks of muscular jerking in face, trunk and extremities may occur. Twenty of my cases followed this course with characteristic symptoms developing so early in the disease that diagnosis did not long remain in doubt. In one young business man transient blurring of vision was the only symptom apart from lethargy that would overpower him during certain hours of the day so that he would fall asleep while dressing or while writing at his desk. In an active lumber merchant in perfect health dizziness and diplopia came suddenly during a motor trip and prevented his driving home. Nine of these patients, nearly all cases of 1919, recovered in from two to ten weeks and have remained well. A physician of 61, taken ill in October, 1919, is still weak and has difficulty with accommodation in reading. Two men are nearly well, but tire readily. One man with onset September, 1919, has still a persistent right internal rectus palsy. One woman of 63 with abrupt onset of external ophthalmoplegia and inactive pupils, lethargy and absent knee jerks, January, 1920, had fever for four weeks and gradually developed a Parkinson's syndrome more marked on the left. She slowly recovered, though always conscious that her left side was not as good as before and traveled to Seattle in summer. Three deaths in her family during September caused her great mental strain and in October there was a rapid return of lethargy, rigidity with again inactive pupils. Tremor and rigidity increased, lethargy persisted and she died February, 1921. A man of 36, in April, 1919, had pains, jerking and later weakness in the muscles of both thighs. In October, 1919, after peculiar paresthesiae in his abdomen he had diplopia, one week later lethargy and still later slow speech, stiffness of his extremities and gradually increasing difficulty in walking.

When examined in February, 1921, he presented the typical Parkinsonian mask, attitude and gait. His spinal fluid at this time was negative except for a Lange curve of 2233331000. Three other patients are even worse off with their legacies of tremor and rigidity. In the above group the chief determination of the virus must be in basal ganglia and brain stem. Mauthner in the encephalitis following the influenza epidemic of 1889-90 first suggested that the interruption of sensory impulses in the thalamus would account for the remarkable lethargy. As Bassoe observes, this lethargy must be regarded as a focal symptom, as it occurs in cases with few general symptoms and a perfectly free sensorium. The Parkinsonian and pseudobulbar syndromes probably represent localization in the corpus striatum and red nucleus.

It is hardly necessary to establish the eleven different clinical types set up by Tilnay and Howe or the fifteen or more listed by Archambault. The rigid adherence to classification may lead to overlooking important minor symptoms and fruste forms of the disease, though it has the great advantage of making us review our knowledge of the anatomy and physiology of the nervous system. In diagnosis it is often wise to forget schemes and remember general principles. We must remember that any part of the nervous system may be attacked by this disease, that peculiar combinations, progression and retrogression of symptoms may be observed, that modes of onset differ greatly, that certain unusual general or focal phenomena may dominate and confuse the picture. Certain difficulties of diagnosis and certain fruste forms will be sufficiently emphasized in the following without adherence to definite grouping:

1. The pain that often precedes myoclonus or other typical symptoms of the disease may be unusually severe, unusually localized and unusually persistent. In the fatal case recorded above intense burning pain was felt in the left index finger two days before myoclonic jerking began in the hand and arm. In a young woman of 25 pain in the left ear and side of the neck led to a diagnosis of ear disease. In a working man of 34 severe pains in both thighs came and went for several days before mild delirium and lethargy were noted. A youg man of 22 while at the theater began to have severe recurrent cramp-like belly pain which lasted for several days and was succeeded by pains down the legs with myoclonus. Denechau reported a case in which a decompression operation was done because of pain about the left ear, which was followed by Jacksonian epilepsy of the right arm. Bassoe mentions that in a young girl pain in the teeth sent her to the dentist; later the pain shifted to the left eye and ear. Intense visceral pain may occur as in the case of a man with such intense pain in the left testicle for two days, unrelieved by opiates, that he demanded operation. Massari (Wien. Klin. Woch. 33, p. 214, 1920) reports six interesting cases of hiccup, abdominal pain and myoclonus, one of which was operated upon for supposed abdominal disease. In one most remarkable case of mine the disease began abruptly with nausea, temperature of 103 and pain referred to the esophagus with a sense of coldness in the right hand; one week later intense pain was referred to the lower thoracic and upper abdominal regions, to be followed in two days by myoclonic jerks of the legs. Pain may be acute neuralgic or a persistent boring or burning or a disagreeable sense of coldness. In the young woman mentioned above with initial pain about the left ear and subsequent intense pain about the left ear and arms, with myoclonus in arms and trunk, burning sensations in the left shoulder and arm are still intensely annoying three months after the onset; there was an early dulling to temperature and pain perception with a burn from a hot water bag over the scapula. Sicard has described these persistent forms of radicular pains. In Pardee's article on the "Acute Descending Radicular Type" emphasis is laid upon the increase of pain as the process descends and the lumbosacral cord is reached. This has not held in all my cases; in one of which pain and myoclonus ascended from legs to trunk.

2. *Myoclonus* may be misinterpreted, though it should be a distinct help in diagnosis. Excellent descriptions of the so-called myoclonic type of the disease have been given by Bassoe, J. Ramsay Hunt, Tilney and Howe, Reilly, and many others. Nine of my cases showed marked myoclonic jerking at different periods of the disease—most often in early stages. In two others jerking of face and arm muscles was much less violent, more in small muscle bundles—myokymia rather than myoclonus. The jerking may begin in face, arm, leg or trunk muscles, and extraordinary movements and distortions occur. The association of rythmic jerking of abdominal muscles with hiccup has been noted above and we shall see later that hiccup lasting for days may precede the myoclonic type as well as other forms of the disease. It is to me impossible to explain why the severe initial radiculat pain usually stops abruptly when myoclonic jerking begins.

3. *Convulsions* may abruptly open the scene, or, as in the case cited above, may follow some weeks after diplopia or other inaugural symptoms. A teacher of 59 had ptosis of the right lid appear abruptly March, 1920, masseter weakness, insomnia, jerking of the abdominal muscles followed in later weeks. In August, 1920, an epileptic convulsion occurred and seizures have been frequent ever since. A woman of 44 with unstable nervous system for years and recent family friction and insomnia had a general convulsion while lecturing October 11, 1919. This was succeeded by temperature of low grade, headache and in two weeks blurred vision, and a second convulsion. Hebetude, stupor, catatonia, mild delirium and hallucinations lasted until December. Spinal fluid November 15 showed globulin + +; 11 cells. Wassermann negative; December 2, globulin + 5 cells; Wassermann alcoholic antigen negative; cholesterin + +. Recovery took place gradually in January, 1921, under indifferent therapy. Cases with Jacksonian epilepsy have been reported by Raymond and Brissaud, Raymond and Claude, Sicard, Dumolard and Aubry.

4. *Meningeal symptoms* may dominate other clinical manifestations. A man of 35 with scars of old operations for tubercular glands of the neck was suddenly taken ill March, 1920, with vomiting, headache and retraction of the neck. Retraction of the neck, pains in the back, slight temperature, stupor persisted for three weeks. In the second week left hemiplegia gradually developed, lethargy continued and it was not until the end of May that he was well enough to leave hospital. Spinal fluid showed nothing abnormal. A boy of 17, who 10 months before had been knocked unconscious while boxing, had two weeks before entrance to the University Hospital blurring of vision, headache and vomiting. He was able to work, but was unusually dull and sleepy. Ten days later he was seized with severe headache, persistent vomiting and pain and stiffness of the neck. As he had a marked Kernig, head retraction, fever, variable reflexes, left external rectus palsy and signs of old tuberculosis in the right upper lobe, the suggestion of tubercular meningitis was strong. But he looked too well for a miningitis of this type causing so many symptoms and signs; the spinal fluid, though under pressure and containing 17 cells per cmm., reduced Fehling solution and showed no web. A history of early jerking in forearm muscles was obtained; his expression was apathetic and lethargic. Recovery was rapid and apparently aided by repeated spinal punctures which showed the effect of increasing irritation from the procedure in the rise of lymphocytes to 150 per cmm. Filtered nasopharyngeal washings and spinal fluid were injected intracranially into rabbits with negative result. In pre-epidemic days I should have called this a serous meningitis.

In the last two months I have seen three extraordinary cases which are most difficult to classify. A young married woman of nervous temperament, who had a long, exhausting illness two years ago following an abdominal operation, was in apparently good health when on March 12 she was suddenly seized with dizziness and intense pain in the back of the head and neck while writing letters at her desk. She was slightly irrational and had severe headache all night and next morning temperature of 99.2. By March 16 she was all right again. On the 18th there was return of severe headache with delirium and neck stiffness. Next day there was occasional peculiar disorientation for short periods, but March 22 she was well and up at dinner. March 23, while about to take a bath in the morning, she had a convulsion followed by delirium and severe headache. When seen she was extremely restless, with head retraction, no changes in reflexes or eye grounds, no obvious paralysis, though she complained of weakness and pains in the legs. On March 24, 10 c.c. of bloody spinal fluid was withdrawn with some temporary relief. The subsequent temperature is shown on the lantern slide. Meningeal irritative symptoms continued. March 30 right hemiplegia developed suddenly. Several spinal punctures showed old and fresh blood admixture. Culture from blood and spinal fluid were negative, Wassermann negative in both. Leucocytes were at first 15,200 and on April 1, 27,100 due to bronchopneumonia, which caused death April 5. No autopsy was obtained.

A female teacher, 31, was abruptly taken ill March 22, 1921, with violent occipital headache. Vomiting persisted for two days, head retraction was marked; delirium, stupor and diplopia were features of the first two days. Spinal fluid withdrawn March 25 and 26 by Dr. Downing of Berkeley, who kindly referred the patient to the University Hospital, was bloody both times, but otherwise negative. Leucocytes were at first 18000 with 83% polynuclears. On entrance to the hospital March 29 the picture was that of acute meningeal irritation. Spinal fluid March 30 gave the xanthocromia of old blood mixture; blood and spinal fluid cultures were negative. Although there was no positive evidence of meningococcus infection 15 c.c. of anti-meningococcic serum were given intraspinally without reaction. Rabbits inoculated with spinal and filtered nasapharyngeal washings did not develop encephalitis. The severe meningeal symptoms slowly began to improve early in April and by April 9 all things were better except that peculiar delusions and hallucinations kept recurring for short periods. April 10 there was renewed headache with vomiting, succeeded however, by several days of slow improvement. April 17 there was a severe relapse ushered in by headache, vomiting and head retraction. April 23, after complaint for two days of something wrong with the eyes, there was definite right ptosis and a wider pupil on the right. April 24 a convulsion was followed by complete right external and internal ophthalmoplegia, drooping of the right face, thickness of speech and some dysphagia. April 26 speech and swallowing were more impaired, the right patella jerk was increased over the left, respiration was slow and irregular with long pauses in which tremor of the face and hands would occur. The patient seemed moribund from advancing involvement of pons and medulla but again rallied, became conscious, the symptoms improved to some degree, and death did not occur until May 3, following another convulsion. The findings at autopsy are not yet clear, and further study will have to decide the cause of successive hemorrhages about the base of the brain with compression of the pons and medulla and involvement of the right oculomotor nerve. Fissinger and Janet, in addition to cases of military tuberculosis and sarcomatosis mistaken for epidemic encephalitis, report one instance of multiple meningeal hemorrhages with history much like the above. A woman of 40 (not syphilitic) was abruptly taken ill with headache, vomiting, diplopia, followed by unconsciousness. May 7, 1920, she was brought to hospital and found to have signs of meningitis; temperature 39, bilateral Babinski and bloody spinal fluid. From May 14 to 20 symptoms improved and temperature fell, May 22 relapse suddenly occurred with headache, diplopia, temperature 39 to 40, with fresh blood in the spinal fluid. Again improvement occurred, to be followed by a relapse of stupor, coma and

death June 7. Autopsy showed diffuse meningeal hemorrhage with preponderance on the right and no microscopical evidence of encephalitis. Inoculation experiments were negative. The cause of the hemorrhage was evidenly not determined.

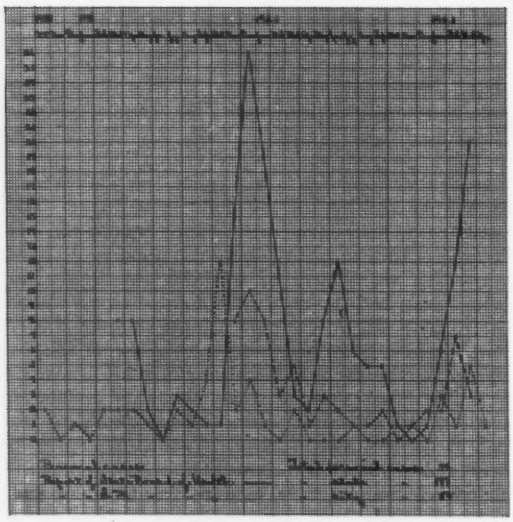
5. *Fruste Forms.* In the aftermath of all epidemics mild, atypical, peculiar cases begin to be recognized. Whereas in the rush of the epidemic many such cases are missed, there is danger later on that too many may be hastily accepted and other conditions overlooked. A man of 67 who had had influenza January, 1920, in January, 1921, felt feverish and out of sorts for a few days. He then had a tooth pulled after novocain injection, continued to feel somewhat below par and in a few days noticed his pupils much dilated and was unable to read. He consulted an oculist, who found absence of light and accommodation reactions and told him he had syphilis. Apart from arteriosclerosis and hypertension nothing was found except the pupillary changes, there being no evidence of syphilis and the pupils became normal after six weeks. A man of 56 had influenza November, 1918, followed by asthenia and diplopia in January, 1919; pupils reacted sluggishly to light and a diagnosis of cerebrospinal syphilis was made. When seen in March, 1919, pupils and eye muscles were normal and Wassermann reaction in blood and spinal fluid was negative. A man of 55 who had had in previous years two attacks of peripheral facial paralysis on different sides, in November, 1920, developed a complete right internal and external ophthalmoplegia. Apart from marked weakness and nervousness there were no other signs. Improvement started December 24 and recovery has since been complete.

I have notes of four cases of unusual vertigo coming on abruptly and associated with transient blurring of vision, with profound exhaustion for several weeks, in one case with apathy and lethargy for seven weeks. In two, Baranyi tests showed moderate involvement of the conduction paths. Three of these cases have wholly recovered and there seems no reason to suppose that they had relation to multiple sclerosis.

At this time particular hesitancy should be shown in making diagnoses of hysteria and neurasthenia and especial care taken to inquire for histories of diplopia, radicular pains with myoclonus, fever, mild delirium or periods of lethargy. An Italian girl was thought to be lazy and hysterical and punished by her parents until a Parkinsonian type of encephalitis sent her to the hospital. A young man had a sore throat and fever in September, 1919, and was left weak and nervous; he was thought to have "nervous prostration" until diplopia developed in a relapse two months later. Mild chronic recurrent types of the disease are particularly liable to misinterpretation, and it must be remembered that even after a year these may develop acute symptoms and end fatally.

6. *Epidemic Hiccup* is a most remarkable affection which has undoubted relations with epidemic encephalitis. In February, March and April, 1919, I saw five cases of hiccup, all in men, lasting from three to six days, and during this same period I heard of many more. Salinas, for a small community, seemed to have an unusual number; another case in October, 1919, lasted three days. No myoclonus accompanied and no sequelae followed any of these cases. In one instance the diaphragm was watched during an attack and found to be contracting equally on the two sides; considerable fluid and a big gas bubble were noted in the stomach and relief followed lavage. The other cases were apaprently helped by chloral and bromid. In Europe an epidemic appears to have started in the winter of 1919-20, the first cases being described by von Economo from Vienna. Sicard and Paraf, Dufour Bénard, Netter, Lhermitte have written entertainingly of the disease in France in the early months of 1920. There may be slight prodromes or a sudden onset. Netter reported a case lasting six days with temperature up to 39. Cases associated with pain in the neck and arm and myoclonic jerkings in arms and abdominal muscles have been recorded. In a few instances undoubted encephalitis has followed a period of hiccup. Clerc and Foix observed one case that started with hiccup, in forty-eight hours developed temperature up to 40, and died soon after in stupor. Autopsy showed inflammation of the entire spinal cord with lesions particularly marked about the third and fourth cervical segments. Von Economo mentions a fatal case with hemorrhages into the anterior and posterior horns of the cervical cord. Sicard reported three cases with hemiplegia; Cade and Dumollard two cases with meningeal irritation.

Diagnosis: The diagnosis in epidemic encephalitis depends chiefly upon the careful analysis, sifting and grouping of the varied nervous symptoms. The most important general symptom is fever. Ephemeral visual disturbances must be given considerable weight. It must be recognized that pupillary disturbances are by no means uncommon, and that isolated Argyle-Robertson pupils may occur. In my experience slight optic neuritis is not at all rare, but I have seen no marked cases, although a few have been reported. In four of my cases the question whether cerebrospinal syphilis could account for all the phenomena had to be weighed carefully, as there were signs which could be so interpreted, and once the Wassermann reaction was present in the blood and twice in the spinal fluid. Fever, however, was present in two cases, myoclonus in two cases, occupational delirium of a very characteristic type in one instance. Syphilis may have been a determinative factor, but in view of the quite typical combinations of symptoms and of the outcome there seems no reason to hesitate with the diagnosis of encephalitis. Guillain, Jacquet, Lechelle have particularly emphasized the identical symptomatology of certain cases of basal syphilis and the mesencephalic type of epidemic encephalitis. Fever and myoclonic jerking are important signs in favor of encephalitis. Lethargy and eye-muscle paralyses are not infrequent in brain tumors, especially in tumors of the quadrigeminal or pituitary regions. Differentiation from encephalitis may be difficult, but as a rule the symptomatology is less varied and less shifting, fever less often occurs, pressure



Cases of epidemic encephalitis in San Francisco and California

symptoms are more pronounced. Nonne has suggested that certain "pseudotumor complexes" may be due to encephalitis and Buzzard and Collier in England, Benechau and Blanc in France have described cases simulating brain tumor and characterized by marked intracranial pressure with choked disc and secondary optic atrophy.

In one case atrophy of trapezius, shoulder-girdle and upper arm muscles, in a second, atrophy of the shoulder and upper arm muscles alone was exactly that of poliomyelitis. One case has already been described as ushered in by pains in the neck and arms. The second case began with insomnia, mild delirium, blurring of vision, January 20, 1921. There was temperature 99 to 100, herpes and pulse rate of 120 for a week or more. Darting pains in the trunk were followed by jerking of the abdominal muscles and, after a month, by paralysis of the deltoids, trapezii, biceps, triceps and extensors of the wrist. When seen March 8, 1921, all muscles were rapidly recovering. I can look back on at least five indefinite cases seen in 1915 which could best be grouped under the heading polionecephalomyelitis. A man of forty-one began January 6, 1915, to have severe pain in the left great toe, which later extended into the foot. One week later he had sudden dysphagia and dysarthria, and, following this in a few days, great weakness of neck, shoulder and arm muscles, with slight weakness of the legs. About the same time he noticed blurred vision and ptosis. When seen six weeks after the onset there was considerable atrophy of the shoulder girdle, gluteii and quadriceps femoris muscles; reflexes were normal, Wassermann was negative. Recovery was slow, but complete. Retrospectively these cases might all now be classed as epidemic encephalitis.

Laboratory Tests: Blood and urine examinations are no help in diagnosis. There is usually a moderate leucocytosis, 7,000 to 15,000 leucocytes. The spinal fluid is usually not under increased pressure, though exceptionally it is decidedly so. It is nearly always clear, though a number of observers have described hemorrhagic fluid. There may be no increase in cells or counts up to 150 or more, practically all lymphocytes. Globulin is increased in over half the cases. Fehling solution is uniformly reduced (an important differentiation from tubercular meningitis). The Wassermann reaction is uniformly negative, except in complicating cerebrospinal syphilis. My experience with Lange's colloidal gold test parallels that of Davis and Kraus and Findlay and Shisken. There may be a perfectly negative curve, or, quite frequently, a moderate luetic, more rarely an outspoken paretic one.

Prognosis: The more cases one sees the more doubtful one becomes about authoritative assertions concerning prognosis. Even allowing for the fact that many cases are not reported, the immediate mortality of the disease is very high; the reports variously rate it from 20 to 40 or even 50 per cent. My cases number forty-two that I regard unquestioned, together with six fruste forms in which ophthalmoplegias, vertigo, slight myoclonus, lethargy, mild delirium occurred in such suggestive combinations that they in all probability should be classed with the disease. The cases of hiccup should be kept apart as representing much milder types of the infection (if they are to be classed here at all). All fruste forms have ended in practical recovery. The group of forty-two cases comprised twenty-nine men and thirteen women. Two women and five men died, seven in all—a mortality of 16 per cent—one woman who died suddenly over a month after onset of the disease from pulmonary embolism and not from encephalitis. An old man committed suicide by gas because incapacitated by the disease of over a year's standing. A man in a deplorable condition from the sequale of an intensely severe myoclonic type of the disease, which was observed for several weeks in the University Hospital, died eight months after the onset in Agnews from septicemia entering from excoriations. One woman died thirteen months after the onset from a relapse of the same type of the disease she had had at first. Others died from twelve days to seven weeks after the onset. A woman taken ill in April this year, is still in a critical condition. Six men and three women have been left more or less completely incapacitated by Parkinsonian tremor and rigidity. I do not take a hopeful view of the outlook in any of these cases; the danger of a recurrence is to be reckoned with at any stage. A child of five has been left in a remarkable hysteroid state with nocturnal delirium that, from the literature, is not an unusual sequel of the disease. Rutmeyer of Zurich reported eight cases of insomnia in children from five to eight, persisting three to six months after the disease; and Leahy and Sands (Jour. Am. Med. Ass., Feb. 5, 1921,) have recently written concerning the same condition; Hofstadt (Muench. Med. Woch., Nov., 1920,) gives a good description of most peculiar nocturnal actions in children from two and one-half to thirteen years which may precede or may follow en-

cephalitis. Eight patients have recovered with legacy of weakness, moderate vertigo, diplopia or slight blurring of vision. Five women and eight men send reports of complete recovery. It is interesting to speculate on how many relapses may occur even in this group; how often in the future we shall see cases of multiple sclerosis, Jacksonian or general epilepsy, localized serous meningitis with simulation of brain tumor, unusual tremors, etc., developing upon the basis of an encephalitis of the last years.

Treatment: There is yet no specific treatment. I feel that nervous tissues from rabbits killed by a fairly "fixed" virus should be prepared in a way similar to that adopted in the Pasteur treatment for rabies and used at least in the chronic recurrent types of the disease. Nothing decisive can be said in favor of hexamethylenamin. Arsphenamin has done no good in two cases of mine; Netter is of the opinion that it does definite harm. Tartar emetic intravenously has not been effective. Netter is still a strong advocate of the Fochier fixation abscess treatment; he cites twenty-five grave cases without treatment by this method, of which 50 per cent died. Out of twenty-seven equally grave cases, nineteen developed local abscesses after the injection of 1 cc. of turpentine, and all got well except a pregnant woman. Netter, like Dr. Margaret Schulze and others, have emphasized the gravity of prognosis in pregnancy. Serum from convalescent encephalitic or poliomyelitic cases has been given intraspinally without positive benefit. The experimental data of Levaditi and Harvier should counsel caution with this method of treatment. Autohemotherapy has been advocated by Mouriquand, Bourges and Marcaudier. Brill reported quick improvement in four out of five patients treated by injecting their own blood serum intraspinally after withdrawing 25-30 cc. of fluid. From my experience opium has not been as successful in controlling sleep and restlessness as chloral and bromid or paraldehyde. In three cases intravenous injection of 2.5 grains of calcium chlorid in 5 per cent solution seemed to have some influence in quieting persistent myoclonus. Hyoscin and scopolamin, hypodermically, will control tremor for a time, as in Parkinson's disease. Although we have learned much from the experiences of the last three years and, even before that, we had advanced far in the classification of infections of the brain and meninges beyond the knowledge of the first half of last century, I cannot help in closing to quote this paragraph on encephalitis from the interesting "Lectures on the Nervous System" of Marshall Hall: "Diseases *will not* suit themselves to our plans. Encephalitis, for example, is sometimes marked almost solely by violent delirium, and is then the *phrenitis* of nosologist; sometimes an early, if not the first symptom, is convulsion; sometimes there is violent headache as the chief symptom. In other cases, the disease is insidious in the highest degree; the patient seems *idle,* perhaps is suspected of *feigning;* he won't move or speak; and there may be *no* other marked symptom. Beware of these things. Cultivate an independent spirit of observation."

THE DIAGNOSIS OF HYPOTHYROIDISM*

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It is very probable that latent hypothyroidism will soon be considered a fairly common disease, although typical cretinism and myxœdema are rare. As a result of a recent study of modern diagnostic methods applicable to this condition, the writer has come to the conclusion that it is frequently possible to diagnose *myxœdema fruste* or Hertoghe's masked type of hypothyroidism where it is little suspected. The diagnosis is based upon the combination of certain clinical symptoms which can usually be regarded as merely indicative, together with the laboratory tests, particularly the basal metabolism. Thus in a small series of consecutive cases of thyroid disease which were analyzed and reported a year ago by the writer, two-thirds were found to be suffering from hypothyroidism, and in only three had the condition been previously diagnosed. As these cases are often greatly benefited and even cured by judicious thyroid treatment, the diagnosis of this condition becomes one of considerable importance. In the present paper, therefore, the clinical and laboratory data of diagnostic importance are collected together with a revision of the differential diagnosis in the light of advancing knowledge.

THE CLINICAL AIDS TO DIAGNOSIS

The family history is important. Questioning may bring out salient points such as history of early or uncontrollable obesity, goitres, protuberant eyes, tremor (thyrotoxicosis symptoms), stunted stature, hairlessness, defective nails, etc., as family characteristics. In doubtful cases in children, the parents should be examined on account of the strong familial tendency. In one instance, the diagnosis became evident in the cases of three children exhibiting retardation of growth through the discovery of marked dysthyroidism in the father.

In the history of the patient the following may prove of importance. In children, obesity, retardation of growth, backwardness at school, disinclination to play due to fatigueability; in adults, increase of weight unaccounted for by habits and diet, lassitude, forgetfulness, lack of vivacity, inability to carry out a vocation which previously was accomplished with ease, or a long history of indefinite ill-health. In adults and children marked predisposition to infections is suspicious in connection with other symptoms.

In considering the diagnosis of hypothyroidism, it is well always to bear in mind that every or any tissue or organ may suffer from a decreased or absent supply of the thyroid hormone. It becomes then particularly important to note the presence of various slight symptoms and signs occurring coincidentally in diverse situations. Among these may first be mentioned the body size in relation to age in the case of children, or to normal adult stature. The growth disturbance due to hypothyroidism sets in very early and is

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usually marked even when classical symptoms are chiefly absent. Shortness and plumpness of the extremities, as well as the trunk, are often of significance. The hands and feet may resemble in slight degree the spade-like hand of hypothyroidism described by Gull; flattened dorsum and palm, due to defective musculature, and weak pyramidal fingers with nail defects about to be described. The feet show similar changes. Owing to the retardation of tendon, cartilage and bone development, flat-foot is unusually common in thyroid children. It would be well if this fact were more generally appreciated by orthopedic specialists, for in these cases artificial arches and special shoes are but palliative, not curative methods.

Certain general features are of some importance. The gait is frequently slow and awkward. Owing to muscular weakness, the sub-thyroid individual tends to stand leaning against some object for support.

The contour of the head in children is inclined to be round, which is emphasized by the obesity. The forehead may be unduly rounded, the eyes and nose smaller than normal, the latter being saddle-shaped. This sign is very commonly met with and is characteristic. The eyelids, particularly the lower, tend to be swollen, and this swelling is not subject to the fluctuations of œdema. The lips may be a little coarser and the mouth and tongue larger than usual.

The skin and its appendages but rarely escape showing a reaction to the disease. They should be systematically examined. A coarse texture and cutaneous dryness are very persistent and early signs. The skin may be atrophic in old cases, be unusually thickened, or exhibit supra-clavicular, cervico-dorsal or lumbar fat-pads. Myxœdematous swellings of the dorsa of the hands and feet are occasionally seen. True myxœdema is rare in the light cases where diagnosis is difficult. It is sometimes perceptible only by a slight thickness of the cuticle. Coolness of the skin and inability to perspire are usually observed. The nails are of considerable diagnostic importance. The following points are pertinent. The size may be decreased, the normal arching absent, and the consistency subnormal even to paper-thinness. Abnormal brittleness may be present, longitudinal or transverse seaming, defective lunulæ and white-spots in the nail matrix. The hair may show defective pigmentation or premature grayness, become thin, brittle, and tend to fall out. The same holds true for the eyebrows, eyelashes, beard, axillary and pubic hair. The eyebrows may be defective in their outer-third (Hertoghe's eye-brow sign). This sign is less important among the Teutonic races, with whom thin eyebrows are normal.

The dentition seldom escapes at least some slight defect. Mention may be made of the delayed eruption of the milk and permanent teeth, imperfect cusp and enamel development, irregularity of position. The palate may be high arched, the uvula long, the tonsils hypertrophied, and adenoids present. It would be well if the nose and throat specialists would bear it more often in mind that tonsillar hypertrophy is frequently an endocrine, and more particularly often a hypothyroid, symptom, better to be treated with thyroid medication rather than the knife. Grant Selfridge has rendered valuable service in calling attention to this fact.

The examination of the thyroid gland is not of very great importance in most cases. If a goitre be present, we may often with right suspect thyroid deficiency. The same holds true when the gland is scarcely palpable. On the other hand, negative results to palpation by no means exclude hypothyroidism, as the thyroid may be of normal size and consistency, but greatly defective functionally. The writer has found it rather helpful to palpate this organ from behind the patient, eliciting its size, contour and consistency by balottement. It is well to give the isthmus special attention, as it is directly subcutaneous. A very small or absent isthmus is usually, but not always, indicative of a small thyroid gland. In adults it is advisable to remember that the thyroid undergoes senile involution with advancing years.

Protuberance of the abdomen in small children is often present even when there is no general adiposity. Gastro-intestinal disturbances, particularly constipation, are extremely frequent. The writer has often remarked the small appetite and intake of food rather than the abnormal appetite accredited to cretins in classical descriptions.

The pulse, respiration and temperature rate are markedly depressed. These signs are of great importance, as they are very frequently present. Even in children the pulse rate will run much lower than the normal for the age of the patient. It is well to bear in mind that even myxœdemic patients with very slow pulses, say, 50 to 60, may show a lability of pulse to excitement. The pulse is usually at its lowest level in the early morning. It has long seemed remarkable to the writer that bradycardia is usually regarded as a condition of little significance if unaccompanied by cardiac or toxic disease. A subnormal temperature is often significant if accompanied by other signs and symptoms. The same applies to the respiratory rate.

Delayed appearance of the secondary sexual characteristics in young individuals is suggestive. Nocturnal enuresis in children may be due to hypothyroidism (Leonard Williams). Impotence in men, menorrhagia, amenorrhœa or sterility in women is frequent in severe cases. The psychic sexual sphere is usually affected. Lack of the *libido sexualis* is frequent, mysanthropy, mysagyny, marital incompatibility and masturbation.

The mind is the seat of abnormalities in practically all cases of hypothyroidism. In children one may observe lack of mental activity. The disposition to play may be lost. The child tends to be quiet and dull, falling behind in his classes, in spite of all efforts on his or his teacher's part. In small children nervousness is frequently observed. They scream at little provocation. In adults, lack of the power of concentration, of memory and mental confusion are complained of. There may be irritability. The normal lability of mood gives way to inertia and depression. Psychoses may develop. Certain cases may exhibit

psychic symptoms so prominently as to be regarded by alienists to have definite mental disease.

Laboratory tests have of late become of especial importance in the detection of hypothyroidism. The basal metabolic rate is decreased in prolonged inanition, diabetes with inanition, and in subfunctional endocrine conditions. Inanition and diabetes can readily be excluded. Among the ductless glandular diseases of subfunctional type, depressing the metabolic rate, hypothyroidism is more frequently met with than any other. It also lowers the metabolism to a greater extent. It must, however, be carefully borne in mind that in other endocrinopathies the metabolic rate may be considerably depressed. Moreover, the difficult cases from the diagnostic standpoint are just those in which there is insufficient reduction of the metabolism to regard them with great certainty as hypothyroidism. Thus the normal limits of the metabolic rate may be regarded as + or —10 per cent deviation; cases of —25 to —40 per cent are probably hypothyroid, but the likelihood of other glandular dystrophies such as hypopituitarism or ovarian dystrophy is increased when only a moderate reduction of the metabolism (from —10 to —25 per cent) is found.

The differential blood-count is sometimes of distinct diagnostic aid in obscure cases. In hypothyroidism there is a tendency to reversion to the foetal type. The polymorphonuclears are decreased, the lymphocytes and mononuclears distinctly increased. In children these variations are normal, but careful examinations will usually show that the lymphocytosis and mononucleosis are in excess of the normal for the age of the patient.

The X-ray is a really important aid to diagnosis in children and young adults. Cases with but a very slight symptomatology may, on röntgenological examination, exhibit wide open epiphyses and a stage of ossification a number of years previous. Siegert, Hermann and Hess have emphasized this diagnostic adjunct.

The diagnosis of hypothyroidism should never depend on laboratory tests alone, nor as can now be stated, solely upon the clinical symptoms. Perhaps, however, too great reliance is being placed nowadays on the basal metabolic determinations, the present enthusiasm suggesting that which met the introduction of the Wessermann reaction. If hypothyroidism be present, there will always be some small accompanying clinical signs to betray its presence, as indicated in the text. The basal metabolic rate should, however, certainly be estimated whenever possible. If, then, in an obscure case we find some trifling clinical suggestions of hypothyroidism and the laboratory reports a depressed basal metabolism, an abnormal blood glucose curve, lymphocytosis, mononucleosis and retardation of growth of the bone nuclei by röntgen-ray, we can frequently establish the diagnosis.

In spite of careful study, the diagnosis may yet remain obscure. It is then that a painstaking application of the therapeutic test will often enable a case to be declared hypothyroid or the reverse. It is not sufficient in carrying out the therapeutic test to merely give a considerable dose of thyroid extract over a week or two, but rather to observe the effect of varying doses as controlled by basal metabolism determinations. This may be done at fortnightly intervals. After each observation the dose may be increased if the rate still runs subnormal or decreased if the metabolism indicates an increase over the normal rate for the patient. A clinical therapeutic effect accompanying a return of the basal metabolism to its proper level is very indicative of hypothyroidism.

DIFFERENTIAL DIAGNOSIS IN CHILDREN

In infants and young children, the laboratory aids to diagnosis are often less applicable. In the presence of a slight growth anomaly in a child, it may be extremely difficult to fix upon the endocrine organ or organs at fault, contrary to textbook statements. Numerically, the thyroid cases are most frequent. With this in mind, a carefully applied therapeutic test with thyroid extract may solve the difficulty. Should an examination demonstrate that but one system of organs is chiefly affected, it is probable that we are not dealing with hypothyroidism. Thus in a child with defective mentality, should the clinical findings be confined to the central nervous system, we are confronted by a case of true idiocy and not cretinism with lowered psyche.

In an article of the present size it is impossible to enter into a detailed account of the differentiation of hypothyroidism from other diseases of children and adults. Reference may be made to the monographs of McCarrison and Crotti, or the chapter on hypothyroidism by the writer in Barker's New American System of the Internal Secretions and of Metabolism (see bibliography).

Hypopituitarism in typical expression can scarcely be confounded with hypothyroidism. In mild cases the diagnosis may not be so easy. The feminine fat distribution (waist to lower third of thigh) and pituitary fossa changes usually suffice to distinguish this condition. The X-ray shows less general bony growth retardation than in hypothyroidism. The laboratory aids to diagnosis are here at fault, as a general similitude to the findings in hypothyroidism exists. A very low basal metabolism is in favor of hypothyroidism. Eunochoidism is distinguished by the prominence of the sexual anomalies, the trochanteric fat podding (Engelbach and Tierney) and the unusual length of the extremities. True infantilism is merely a condition of cessation of development at an early age. In a case investigated by the writer, which seemed to belong to the rare variety of infantilism described by Peltauf, the metabolism was normal. True nanism refers to a very small adult. human being, symmetrically developed in all respects. Mongolism is still confused at times with hypothyroidism, though the mutual resemblance in typical instances is but very superficial. The following are the chief points of difference. The mongol has a curious Oriental expression, silken hair, slanting eyes and button-like nose, a pointed tongue, small gracile hands with incurving little fingers. The delay in the ossification is but slight. Rickets and chondodystrophy are easily distinguished by röntgenological examinations of the bones showing typical lesions.

DIFFERENTIAL DIAGNOSIS IN ADULTS

Too often physicians have a mental picture of typical myxœdema, which prevents them from looking beyond for the atypical but more common manifestations of hypothyroidism. The presenting symptoms of latent hypothyroidism so often direct the attention of the medical observer rather away from than toward the thyroid gland that mistaken diagnoses in light cases of hypothyroidism are frequent. Thus the subthyroid patient may consult the internist for failure of memory and the power of concentration, suggesting the cerebral changes of arteriosclerosis, which itself is not uncommon in hypothyroidism. Gastro-intestinal symptoms such as lack of appetite, dragging sensations in the abdomen or constipation, may send the patient to a gastro-enterologist; a thyroid psychosis to an alienist; again weakness and pains in the joints and limbs or flat-feet may cause the orthopedist to be consulted. Yet all the above symptoms may be but expressions of the lack of proper functional activity of the thyroid gland.

One of the most important conditions confused with hypothyroidism in the adult is neurasthenia. This syndrome is characterized by mental irritability and depression, loss of memory and the power of concentration, eyestrain for little reason, great physical asthenia, parasthesias, reflex gastro-intestinal neuroses, and vague pains in various areas. Yet each and every one of these symptoms may be expressions of hypothyroidism. In general, it seems that if our diagnostic methods were more refined we would have less recourse to the diagnosis of neurasthenia for want of a more definite ailment.

Of the gastro-intestinal conditions, which require differentiation from hypothyroidism, must be mentioned chronic colitis, which may also occur as a complication in hypothyroidism. The intestinal toxæmic symptoms of headache, lassitude, nervousness or mental torpor, loss of appetite, a light anæmia, cold extremities, low blood pressure and small, soft pulse may likewise be of hypothyroid origin and lead to diagnostic errors. Two cases of the writer's series had been unsuccessfully treated by others for ten or more years for chronic colitis with intestinal toxæmia. After the diagnosis of hypothyroidism was reached, both made astonishing improvement on thyroid medication controlled by the basal metabolism.

Chronic muscular rheumatism, or mild arthritides, may be hypothyroid manifestations. As Kocher first emphasized, the muscular and joint pains of hypothyroidism may lead to erroneously considering such patients as suffering from chronic muscular rheumatism or rheumatic arthritides.

Various cachetic conditions, such as anæmia or arteriosclerosis, are mistakenly regarded at times as *sui generis*, when in reality they may be due to subfunctional activity of the thyroid gland.

Mistakes as to the true nature of thyreogenic obesity are common. Application of the usual reduction cures to such cases may lead to a profound asthenia. All cases of thyreogenic obesity, as yet observed by the writer, have been accompanied by clinical signs of hypothyroidism, permitting of actual differential diagnosis, if properly appreciated.

SUMMARY AND CONCLUSIONS

1. Latent hypothyroidism is much more common than is generally appreciated.
2. With the aid of special diagnostic tests, particularly the determination of the basal metabolism, hypothyroidism can now be certainly diagnosed much more frequently than formerly.
3. A critical survey of the clinical and laboratory data of diagnostic importance in hypothyroidism is given.
4. The differential diagnosis of hypothyroidism from other diseases is briefly summarized in the light of recent knowledge.

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PERSONAL EXPERIENCE WITH THE USE OF ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY DISEASE.*

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The reason for presenting the subject of Artificial Pneumothorax in the treatment of Pulmonary Tuberculosis is that this very valuable aid to the phthisio-therapist is not sufficiently appreciated by the medical profession and too little is known of the technic and indications for its use. This is by no means the fault of those members of the medical profession who are not tuberculosis specialists, but the blame must be laid, to a large extent, to the conflicting reports as to its value which have appeared in the medical press from

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the pens of those who have actually made use of the pneumothorax operation.

There is perhaps no other disease for which more remedies or remedial measures have been offered than have been presented for the cure of tuberculosis, and the history of medicine would probably show that about the subject of the value or the worthlessness of these remedies there has been waged a fiercer fight than about the worth or worthlessness of the remedies put forward for any other disease. And as yet we have no cure for tuberculosis, but out of all the struggle and study and research we have today many valuable aids to cure.

The history of many of these remedies has been very much alike. There have been:

1. Extravagant claims: when the many have testified in glowing terms and the few have urged caution and conservatism.
2. The period of unjustifiable condemnation: when the many have been loud in their expression of lack of approval and the few have continued to experiment.
3. The time of final judgment: when the method or remedy has been declared worthless or when it has been accepted as of value and its true worth fairly accurately appraised.

During the first period, that of extravagant claims, hardly too much can be said in favor of the remedy; it is applied to every type of case whether suitable or unsuitable, case reports are given and conclusions drawn without waiting a sufficient time to see whether or not such conclusions are justified. And the second state, that of condemnation, follows as night follows day. Experience proves that the first claims were unjustified, as they must surely be, having been founded upon the shifting sands of unbridled enthusiasm, unsuitable cases and too hasty conclusions. And during the period of condemnation the good is swept away with the bad, the favorable with the unfavorable, and a measure inherently good when properly applied to suitable cases is, at the worst, completely lost or, at the best, used to only a limited extent of its usefulness.

The operation of artificial pneumothorax has been through these periods of extravagant claims and of unjustifiable condemnation. It is the belief of the author, based upon his experience, that this method has a very definite place in the treatment of tuberculosis and that in certain cases it is the most valuable single measure which we possess. There are times when the results obtained are as striking as those following the use of mercury or salvarsan on the lesions of syphilis, and it was the results seen in such cases that led to the unfounded conclusions of the stage of extravagant claims. But the application of this measure is just as certainly very clearly limited, and it is to the failure to appreciate this fact that we can ascribe the period of unjustifiable condemnation. If one is to place a true value upon artificial pneumothorax he must have a knowledge not only of its limitations, but must know something of the class of cases suitable for its exhibition as well as to be acquainted with the technic of operation. The mastering of the technic is the simplest part of the acquiring of skill in the application of the operation.

There are two general rules which can be laid down in the matter of determination as to the use of pneumothorax. They are, broadly speaking, true, but are subject to certain exceptions.

1. No patient should be submitted to operation without first having been given the benefit of ordinary measures for two or three months or longer.
2. Pneumothorax should be attempted only where, as far as can be ascertained, the patient will not recover under the ordinary methods.

The reason for the first rule is that many patients, who might at first seem very suitable cases for pneumothorax, and many patients who are very far advanced, will secure an arrest and lose their symptoms under ordinary measures. Whether a patient recovers from tuberculosis or not depends to a very large extent upon his individual resistance to tuberculosis, and the patient's resistance is something which we cannot determine by means of any method of examination at present in our possession. There are certian dangers inherent to the production of artificial pneumothorax, and it is not fair to a patient to subject him to these dangers unnecessarily. Also, to be of value, lung compression must be continued over many months or even years, during which time the patient is more or less tied to his physician or to the neighborhood of the sanatorium at no little expense and inconvenience, and it is likewise unfair to the patient to create such conditions unnecessarily. This paper is entitled "Personal Experience With the Use of Artificial Pneumothorax in the Treatment of Pulmonary Disease," and I would say that, broadly speaking, I should not allow artificial pneumothorax to be used on me personally unless I had had a trial of other measures for two or three months without avail. There are, of course, exceptions to this rule, as in cases of alarming and uncontrollable hemorrhage or of a rapid decline in spite of the use of every other method of treatment.

The second rule, which is rather a modified way of stating the first, is that pneumothorax should be attempted only where, so far as can be ascertained, the patient will not recover under the ordinary methods of treatment. These are the patients, then, from which our pneumothorax cases are to be selected, and in considering results one should bear in mind that every successful pneumothorax case means really the saving of a life which would be otherwise sacrificed. Even 5 per cent or, for that matter, 1 per cent of success, with 95 or 99 per cent of failures, would mean that the measure is justifiable, and the true percentage of success, which is much higher, as can be shown by statistics and by living patients, more than justifies its use.

All patients suffering from tuberculosis can be classified into three groups in their relation to pneumothorax and the advisability or inadvisability of operation.

1. Those in which operation is urgently indicated. These are cases of persistent hemorrhage, where the bleeding is not controlled by rest and

ordinary measures. Some of the most brilliant results are obtained in this class of cases. It is the one positive thing we can do for the control of pulmonary hemorrhage, and the physician who does not use pneumothorax in cases of otherwise uncontrollable hemorrhage is, in my opinion, not doing everything in his power for his patient.

2. There are what may be termed the cases of election. These are patients who are steadily going down hill and in whom the tuberculous process is mainly unilateral. Such patients have one lung in which a large proportion or nearly all is relatively unimpaired and is capable of bearing alone the burden of respiratory function. Given such a case, where the pleural cavity of the diseased lung is not obliterated by adhesions, the change from continuous decline to convalescence is one of the most striking things with which the practitioner can come in contact. It is little wonder that the success in such cases led to unbounded enthusiasm and false claims.

3. There are what may be termed unsuitable cases. In this class are moribund patients; pneumothorax cannot resurrect the dead, early claims to the contrary, notwithstanding. Into this group also fall those cases of advanced bilateral lesions where there is not enough lung tissue in the relatively good lung to carry on the necessary work, or where the activity is pronounced in both lungs. There is a limit beyond which one cannot expect beneficial results. Between the extremes of obviously suitable and just as obviously unsuitable cases there are many border-line patients in which it is impossible to hazard a guess as to the probability of success. Every operator compresses many of these border-line cases with varying results. He does so for a number of reasons; sometimes because of the optimism engendered by previous success; sometimes at the earnest solicitation of the patient, and even against his better judgment; sometimes because of the pleading of relatives, who would try everything that would offer even the least hope in an otherwise apparently hopeless case. In such cases the physician has recourse to his experience and remembers those seemingly hopeless cases which have with time and care become arrested, and he pays heed to the dictates of his heart, which tell him that where he cannot heal it is his duty to comfort.

The complications which have been reported have been many. This being a report of personal experiences, I shall report only those seen by me. The most common complication is the presence of adhesions. When, as a result of previous pleurisy, a sufficient percentage of the lung surface is adherent to the chest wall and the pleural cavity cannot be located, the operation is a failure. Where the lung is partly adherent or bound down by a few dense adhesions, success or failure will depend upon whether the adhesions are so located or are strong enough to prevent sufficient pressure being exerted to immobilize the actively diseased tuberculous process. While one may form a fairly good opinion from examination and before operation as to the probability of the existence of adhesions, in the majority of cases the only real method of determining whether a compression is possible is by operation.

In a series of ninety-one consecutive cases, which I looked up in my records, I found that twenty-five cases, or 27.5 per cent, could not be compressed at all because of adhesions; thirty-two cases, or 35.1 per cent, could be only partly compressed, and that in thirty-four cases, or 37.4 per cent, we were able to secure complete compressions.

Tables 1, 2 and 3 show just what adhesions mean when expressed in figures of death, non-improvement, improvement and arrest.

TABLE 1

Results in cases where no gas was injected because of adhesions. Number of cases, 25.

Died	4	16%
Discharged unimproved	17	68%
Discharged somewhat improved	2	8%
Apparently arrested	2	8%
	25	100%

Table 1 shows the result in the twenty-five cases in whom it was impossible to locate the pleural cavity. In this group four, or 16%, died; seventeen, or 68%, were discharged unimproved; two, or 8%, left the institution somewhat improved in spite of failure to compress; and two, or 8%, secured an apparent arrest as a result of continued hygienic dietetic treatment. The two who secured an apparent arrest, after being adjudged hopeless, are living reminders of the fallability of human judgment as exemplified by the Colfax staff.

TABLE 2

Results in cases of incomplete compressions. Number of cases, 32.

Died	7	21.9%
Unimproved	15	46.7%
Improved	7	21.9%
Apparently arrested	3	9.5%
	32	100 %

Table 2 shows the results in thirty-two cases of incomplete compressions. In this group seven, or 21.9%, were improved and three, or 9.5%, apparently arrested.

TABLE 3

Results in cases of more or less complete compression. Number of cases, 34.

Died	5	14.7%
Unimproved	4	11.8%
Improved	9	26.5%
Apparently arrested	16	47 %
	34	100 %

Table 3 shows the results in thirty-four cases more or less completely compressed. As is to be expected, the results are very much better than in Table 2. Table 3 shows that nine, or 26.5%, were improved and that sixteen, or 47%, were apparently arrested.

The second most common complication in our experience is the occurrence of effusion. This happens not infrequently, and, in our opinion, is not unwelcome, as not uncommonly the fluid fills the entire pleural cavity and acts as a splint, thus

taking the place of the injected air. In that case it does away with the necessity of refilling the pleural cavity with air. If the occurrence of effusion is characterized by a high temperature and much toxemia, we aspirate the fluid, inject a few c.c. subcutaneously, thus taking advantage of autoserotherapy and replace the fluid with air, using the same needle for both operations. When the effusion gives rise to no symptoms it is not disturbed. Sometimes fluid is withdrawn and replaced by air several times. The aspirations and refills are repeated until the temperature becomes normal.

There are many theories advanced as to the cause of effusion in pneumothorax patients, but it seems to me that the experiments of Patterson at Saranac Lake probably furnish the correct explanation. Patterson found that if he injected tubercle bacilli into the pleural cavities of non-tuberculous animals that he failed to secure an effusion but if he reinjected his animals or caused a tuberculous pleuritis in otherwise infected animals that the operation was invariably followed by effusion. Paterson believed as a result of his experiments that the cells of the pleura were sensitized by the original infection and the occurrence of effusion was the expression of the reaction of sensitized cells to the second injection of tubercle bacilli.

It has seemed to me that effusions in pneumothorax cases might be the result of a fresh infection of the pleura due either to extension of the disease from the pulmonary tissue or following an injury to the pleura during operation.

In the series of ninety-one cases above referred to, thirty-two cases developed fluid as a complication. But as twenty-five of the ninety-one cases were not real pneumothorax cases, because no air was injected because of adhesions, the thirty-two cases of effusion occurred in a series of sixty-six patients, a percentage of 48.5. That the occurrence of effusion is not such a formidable nor such a serious complication as one would believe from reading the literature is shown by an analysis of the results obtained in these thirty-two cases as compared with the results obtained in the total of sixty-six cases of both partial and complete compressions.

TABLE 4

Cases developing fluid effusion during treatment. Number of cases, 32.

Died	7	21.9%
Unimproved	5	15.6%
Improved	8	25 %
Apparently arrested	12	37.5%
	32	100 %

TABLE 5

Results obtained in 66 cases, including the 32 cases which had effusion.

Died	12	18.2%
Unimproved	19	28.8%
Improved	16	24.2%
Apparently arrested	19	28.8%
	66	100 %

A third complication, which is really an annoyance rather than a complication, is the occurrence of subcutaneous emphysema, due to the escape of air from the pleural cavity along the needle track. This is more apt to occur following the first inflation, when a larger needle is used than is customary for refills. By the exercise of care at operation and by carefully massaging over the site of operation to obliterate the needle track, and by the use of a small needle for refills, the complication can be reduced to a minimum, although its occurrence can not be entirely obviated. Subcutaneous emphysema, as we have seen it, is, as stated above, merely an annoyance. The air is soon absorbed and we have seen no permanent ill effects as a result.

Spontaneous pneumothorax, due to tearing of the lung during the separation of adhesions, has occurred. It also happened in one of our cases where the patient coughed violently without premonitory warning, with the result that the needle evidently caused a tear of the lung. As the patient recovered after a rather strenuous twenty-four hours, we were unable to verify our belief that the lung had been torn.

A more serious complication, and one that we have seen in a few cases, is the lighting up of activity in the good lung. The best way to avoid this difficulty is to compress slowly, not giving too large doses at any one operation, and allow the other lung to accommodate itself to the extra load which it must necessarily carry.

These are the principal complications which we have seen. Pleural shock and air embolism we have never seen, nor have we ever seen a death which we could attribute to the production of the pneumothorax.

The instrument which we use is the ordinary Floyd Robinson apparatus. We have used the same apparatus since we commenced doing the work, and have seen no reason to change. We have seen many different forms of apparatus, some simple, some complicated, some of them home-made, and they all have been praised by their operators. Any one with a little mechanical ability and ingenuity can construct one at home. As with any other operation, success depends more upon the operator than upon the instrument he uses.

The technic is very simple and can be found in the abundant literature on the subject. The principal points to be remembered are to have the track of the needle well anesthetized and to never inject air unless one gets a negative oscillating pressure on the manometer.

The intervals between doses and the size of the dose to be given depends upon the individual case. It is our practice to commence with small doses, except in urgent cases of hemorrhage, and to refill frequently with gradually increasing doses until we secure the necessary compression. From then on the refills are given as often as is necessary, and this is ascertained by questioning the patient, by watching the patient's record book for the occurrence of symptoms of reduced pressure, such as increased cough and temperature, and by careful fluoroscopic screening to determine whether the

lung is expanding. It is not possible to lay down definite rules in these matters any more than it is to lay down rules for the dosage of tuberculin. One can get satisfactory results only by individualizing.

In conclusion, I would like to report a few cases to illustrate points I wish to impress:

Case 1. Mrs. B. entered the Colony April, 1915; has not been feeling well since birth of second child in 1909. Tuberculosis diagnosed 1911. By taking excellent care of herself has managed to about hold her own and gain some weight. Recently has been feeling only fairly well. Examination shows extensive lesion of the left lung, with cavitation and minor involvement of the right apex. In spite of being kept more or less continually in bed for sixteen months, patient failed to improve and continued to run a temperature. In August, 1916, artificial pneumothorax was commenced. Because the fluoroscope showed the presence of a large cavity held to the chest wall by a rather dense adhesion, compression could be given only with the greatest care. Eventually the adhesion gave way without tearing the lung tissue. Patient now has been receiving pneumothorax for fifty-seven months and is in good general health, well nourished, without fever, with very little sputum, which is free from tubercle bacilli, and returns once in eight weeks for refills. Lesion apparently arrested.

This case illustrates two points I would like to make: First, that by means of lung compression a hopeless invalid can be changed to a happy, apparently healthy individual; and, second, that the patient on whom artificial pneumothorax is commenced is more or less tied to his physician over a long period of time, and compression should not be commenced without first giving the patient a chance with other measures. Case one is, of course, an extreme case, as it is relatively very rare to keep up pneumothorax over so long a period of time.

Case 2. T. M. admitted August, 1915, with advanced tuberculosis of both lungs, especially the left. Patient continued to get steadily worse in spite of absolute rest in bed and ordinary methods of treatment; also suffered from harassing cough, which required the use of codein and heroin several times daily. Pneumothorax commenced October 7 (about two months after arrival) and continued to November 27, nine compressions being given. At this time effusion commenced and continued to increase in volume until the pleural cavity was completely filled. Patient left the institution May 1 an apparently arrested case, having gained more than forty pounds in weight. The pleural cavity was filled with fluid at the time of departure.

November 9, 1916, he wrote that he was working every day and getting stronger all the time. He continued to work hard at manual labor until March, 1920, when he contracted influenza. He returned to Colfax June 9 of that year. Examination at that time showed that the left lung was largely cicatricial tissue, but that there had been a lighting up of the old focus on that side, probably as a result of the influenza. At the time of examination his temperature was normal and he felt well, but tired easily. There were tubercle bacilli in the sputum. He re-entered the Colony for three months, and since that time has been working hard every day and at last reports was in good health.

This patient was apparently the most hopeless case we have seen which has secured an arrest following pneumothorax. It illustrates the fact that the occurrence of effusion may be not a complication, but rather an incident of decided benefit.

Case 3. P. B. entered the hospital February, 1917, with an extensive lesion involving the greater part of the right lung and a slight lesion at the left apex. In spite of absolute rest in bed, patient continued to run a temperature daily of 101 to 102. Artificial pneumothorax was commenced April 27 (two months after arrival). After the third compression, May 7, temperature dropped to normal and has remained normal since. Patient discharged November 3, 1917. Has been working as a chauffeur for more than three years and at last report was in perfect health.

This case illustrates a very rapid drop in temperature, which is sometimes seen following the commencement of pneumothorax, particularly where a complete compression is obtained and where one lung is in good condition.

CONCLUSIONS:

1. Artificial pneumothorax is a very distinct aid to cure in some otherwise hopeless cases.
2. The only real difficulty in administering the treatment is the presence of adhesions.
3. The dangers of this form of treatment are relatively very slight if proper precautions are taken.
4. The principle disadvantage is the long period of time during which compression must be kept up. This might, in a measure, be obviated if the general practitioner familiarized himself with the technic of refills.
5. No case, except the moribund, or those with large bilateral lesions, should be considered absolutely hopeless until after pneumothorax has been tried and has failed.

MONTHLY FLUCTUATIONS IN THE NORMAL METABOLIC RATES OF MEN AND WOMEN.*

By ALBERT H. ROWE, M. S., M. D., Oakland, and MARGARET EAKIN, B. A.

This discussion of normal fluctuations in the metabolic rates of men and women is attempted with the hope of pointing out certain probable variations in the metabolic curve in the female and possibly in the male as well. All such data and hypotheses bearing on this subject are of great importance since the final word has not been said about the normal values of basal metabolism. Benedict in his monograph of 1919, on metabolism writes, "Investigators in pathology are continually confronted by the paucity of normal data with which to compare their observations", and Gephart and Du Bois say, "In the study of

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metabolism, the normal control is coming to be recognized as the weakest part of the experiment."

The normal limits of basal metabolism for adults between the ages of twenty and seventy have been very carefully established by Benedict in his recent monograph, "A Biometric Study of Basal Metabolism in Man." These normal predictions have been obtained by the mathematical biometric formulas which have taken into account age, weight, stature, and sex, and are based on the constants of about 250 adults. It is interesting that these same values of Benedict's for normal men and women can also be approximately obtained from straight line standards we have plotted as shown in Chart I. These straight lines are obtained by using the original normal values of Du Bois for men and women. In the case of men, the starting point is 39.7 calories per hour per square meter of body surface for the age of twenty, and the decrease per year is .15 calories while in women the starting point is 36.9 calories for the same age and the decrease is .123 calories per year.

In table I, we have tabulated the metabolic rates of a separate patient for each age from 20 to 60. The rates have been estimated by the use of Du Bois' newer standards, by the use of Benedict's tables, and by the use of the straight lines as plotted above. These rates show that little difference exists between the results obtained by Benedict's tables and by the straight lines. Our table shows, however, that the difference between the values obtained by Benedict's figures and by the newer normals of Du Bois gradually increases toward the end of each decade, those values of Benedict's being uniformly higher It is interesting that these differences are approximately equal at the beginning of each ten-year period. These results influence us to agree with Benedict's statement that, "changes in metabolism after physical maturity are not merely continuous, but are uniform in amount, so that they can be reasonably well represented by the slope of a straight line," and we feel that each age should be taken into account in the establishment of normal standards.

For our work we have continued to use Du Bois' standards, since most of the results published to-day are still based on those. However, in the future we intend to use the standards established by Benedict or as estimted by the straight line standard. In the interpretation of our results, we feel that metabolic rates above +20% or below —20% are unquestionably pathological. Those results however, which are between +10 and +20% and —10 and —20% must be interpreted according to clinical evidence since the upper and lower limits of normal metabolism are not as yet definitely established for all types of individuals.

In passing it is well to point out that insufficient data is at present available for us to be sure about the normal basal metabolism of children and youths up to the age of twenty and of people over the age of fifty. Benedict says that such data is especially lacking for girls and he is unable to say whether the gradual reduction in metabolism which occurs from childhood to old age can be represented by a straight line from childhood through puberty to the age of twenty and by a straight line after the age of seventy to death as it probably can be between the ages of twenty and seventy. It is indeed possible that as the girl and boy mature sexually their metabolism decreases rather suddenly, to which view certain of our experiments incline us to believe.

EXPERIMENTAL WORK.

Our experimental work of the last year has been devoted to a study of the possible influence that the sexual glands have on the normal metabolic rates of men and women. Since the thyroid controls the metabolic rate to a large extent, any fluctuations in the metabolic rate associated with the sexual glands would probably be due to the resulting activity of the thyroid.

INFLUENCE OF MENSTRUATION.

Much clinical evidence supports the idea that the thyroid is influenced by ovarian activity. For instance it is well known that the thyroid usually enlarges with puberty and menstruation, with marriage, during pregnancy, and often with uterine or ovarian congestion. Goiter occurs more frequently in the female than in the male and most frequently during sexual life. It is interesting that Gaskell, as reported recently by Bear, states that the thyroid was derived from the uterus in the paleostracan ancestor. Thus it appears probable that a definite influence is exerted by the ovary on the thyroid gland.

That the metabolic rate is influenced by menstruation was first pointed out by Snell, Ford and Rountree in April of last year. No other investigations of this effect of menstruation on metabolism have been reported. These investigators, however, only devote two paragraphs to their observations and publish a chart which shows that "a rather constant rise occurs during menstruation or in the pre-menstrual period, the rise being followed by a post-menstrual fall." Ten cases were studied. Of these, two showed practically constant rises and six constant rises varying from 4% to 14%, the average being 10%, while in two a drop in rate was encountered. Values outside normal limits, ±10% were infrequent.

Our study of the effect of menstruation on the metabolic rate of women up to the present time has been made with the modified Tissot appartus on seven subjects, one of whom is pregnant, and from this work we feel that we can agree with the general conclusions of Snell, Ford, and Rountree.

Our charts of non-pregnant women in "Series A," show first, a uniform pre-menstrual rise occuring within the week preceding the onset of the perod, with the exception of the last observation in subject 4, during the carrying out of which test the patient went to sleep. This last rate would have been eight to ten points higher if she had not slept and this lowering emphasizes the importance of keeping the subject awake during the test. Secondly, our charts show that with the onset of menstruation or possibly a few hours

Table I

A Comparison of Metabolic Rates Based on the Standards of Benedict and Du Bois and the Straight Line Standard of Chart I

Case Number	Name	Age	Sex	Metabolic Rate according To Standard of Benedict	Metabolic Rate according To Standard of Du Bois	Metabolic Rate according To Standard of Straight Line	Difference between rates of Benedict and Du Bois	Difference between rates Benedict and St. Line
61	E A	20	F	+ 282	- 82	+ 125	-282	-077
14	P C	21	F	+446	+418	+451	-28	+05
77	W H O	22	F	- 552	- 92	- 68	-368	-128
63	H H R	23	F	+ 120	+ 86	+118	-34	-01
53	R T C	24	M	+ 1358	+ 115	+1295	-208	-063
5	M M	25	F	+ 435	+ 112	+ 462	-323	+027
80	H M Q	26	F	- 188	- 486	- 119	-303	-069
95	R O	27	F	+ 121	+ 324	+ 832	-826	-378
39	C O	28	F	+ 80	+ 0	+ 416	-80	-334
1	G B	29	F	+ 68	- 16	+ 336	-84	-344
107	A W G	30	F	- 259	- 60	- 36	-341	-101
38	H J K	31	F	+ 1184	+ 962	+1283	-142	+176
49	R R S	32	F	- 772	-110	- 818	-328	-046
19	R E B	33	F	- 722	-1085	- 578	-373	-05
33	H B	34	F	+ 58	+ 315	+ 727	-275	+147
28	E P	35	F	+238	+225	+278	-13	+40
44	R E D	36	F	- 497	-1045	- 623	-549	-126
4	A K	37	F	+ 1879	+ 718	+1266	-355	+187

Table I continued

Case Number	Name	Age	Sex	Metabolic Rate according To Standard of Benedict	Metabolic Rate according To Standard of Du Bois	Metabolic Rate according To Standard of Straight Line	Difference between Rates of Benedict and Du Bois	Difference between rates Benedict and St. Line
24	R B	38	F	+1872	+ 845	+1444	-1027	-432
17	M L	39	M	+1464	+1347	+1448	-117	-16
50	T C	40	F	+ 1247	+ 26	+ 201	-1013	-046
84	L M C	41	F	+ 15	+ 1082	+ 608	-058	+458
73	H P	42	F	+ 568	+ 325	+ 895	-243	+327
92	L E	44	F	+2083	+2330	+2075	-63	+145
78	I S	45	F	+1206	+1159	+1236	-47	+ 30
31	B G	46	F	- 276	- 88	- 348	-1204	- 072
42	W H K	47	F	+1387	+1289	+1396	-88	+ 09
28	Mrs M	48	F	- 52	-140	- 728	-82	- 148
11	A M	49	F	+1393	+1282	+1388	-117	- 11
62	N C	51	F	+ 814	- 227	+ 313	-1441	+ 099
41	L C C	52	F	+ 286	- 70	- 186	-1414	+ 18
68	E H	53	F	+ 1865	+ 1466	+ 1889	-1399	+325
58	S A M	54	F	+ 715	- 077	+ 637	-1792	-078
59	T W H	55	F	-228	-2282	-2283	-54	0
8	J & R	57	F	+ 1461	- 257	+ 552	-1718	+ 091
36	D H P	58	F	+1695	+ 743	+1657	-1152	-025
43	G F	59	F	- 33	-1200	- 408	- 87	-078

Chart I

Straight Line Standard of Heat Production in Normal Men and Women based on The Original Values of Du Bois.

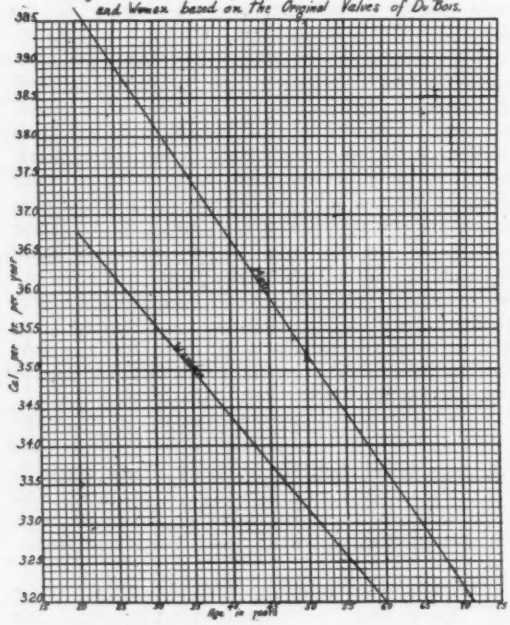
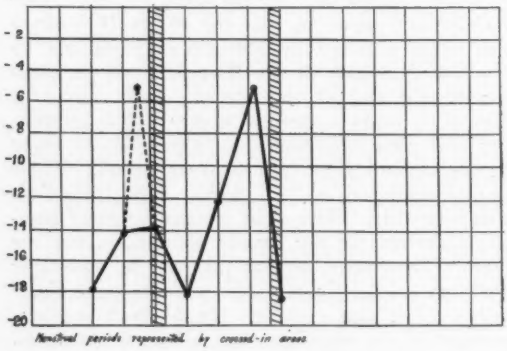


Chart II

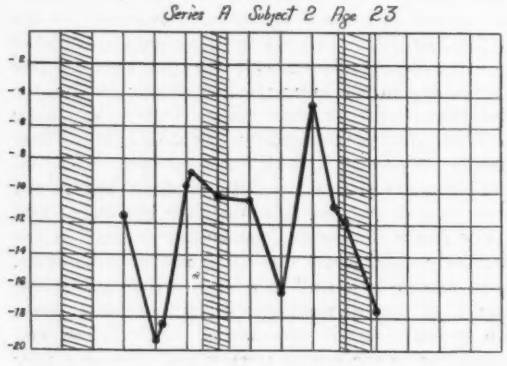
Series A Subject 1 Age 46



Menstrual periods represented by crossed-in areas

Chart III

Series A Subject 2 Age 23



before, the metabolic rate probably falls and may reach its lowest level during the menstrual period or within the following two weeks.

All of the rates in our cases fluctuate up to a maximum of from 13 to 18 points. The low levels of —18 and —19 in subject 2 occurred in a normal subject who certainly showed no signs of glandular deficiency. Had these results been obtained by Benedict's standards they would have

Chart IV
Series A Subject 3 Age 27

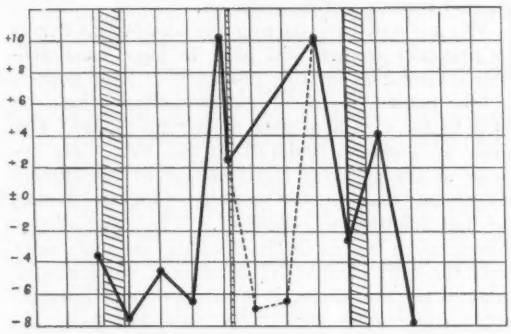


Chart VIII
Series C Subject 1 Age 20

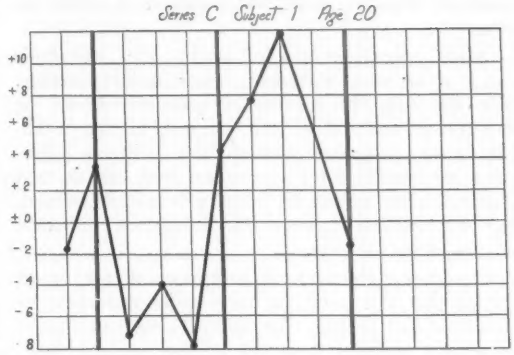


Chart V
Series A Subject 4 Age 31

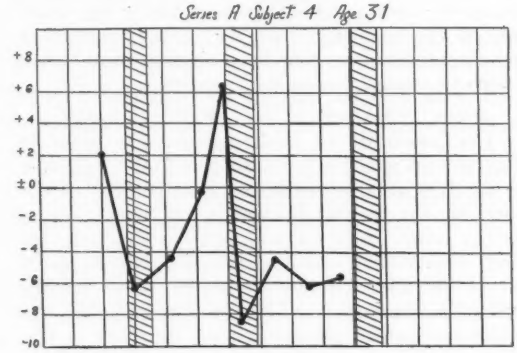


Chart IX
Series C Subject 2 Age 22

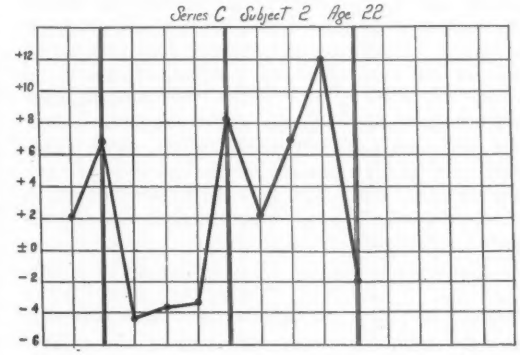


Chart VI
Series A Subject 5 Age 15 Series A Subject 6 Age 13

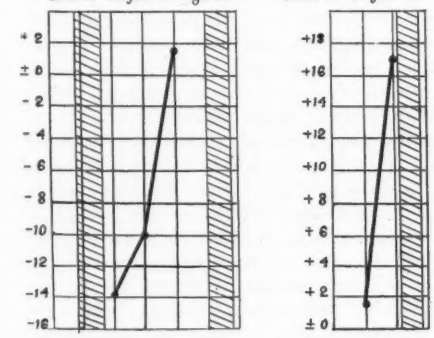


Chart X
Monthly Fluctuations in the Basal Metabolic Rate of a Normal Man.
Taken from Benedict: Carn Inst Wash Pub 187. 1913 Table 31 Pg 98

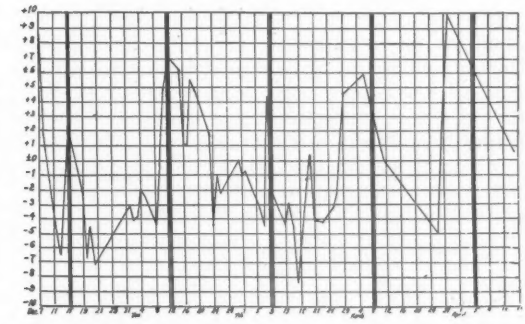
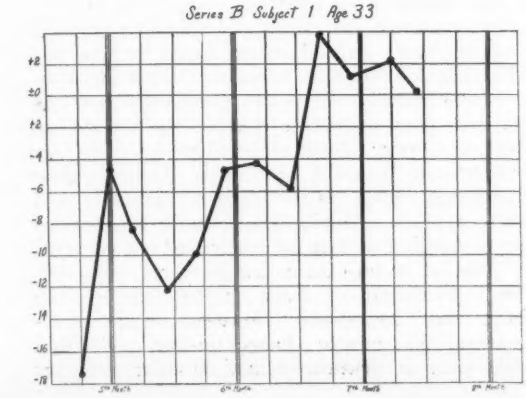


Chart VII
Series B Subject 1 Age 33



been about three points higher. However, if subject 3 had been calculated by Benedict's standards her high rates would have been in hyper-thyroid limits. These results serve to show the lack of value of single determinations in the limits of ± 10 to ± 20%.

In subjects 1 and 3 dotted lines have been drawn to indicate the possible fluctuations in the metabolic rates had the cases been studied at more frequent intervals. The high value in subject 6 may be due to the fact that menstruation had only been established two months. The low values obtained in subject 1, may have resulted from the fact that definite signs of menopause are present. It is not improbable that heat production decreases

suddenly with the onset and cessation of menstrual life.

That menstruation influences the metabolic rates of women, therefore, seems quite probable. We feel that this menstrual influence should be recognized and taken into account in the establishing of a normal standard for women. Benedict has established his normals from one or two separate observations on over a hundred women, but has entirely ignored the menstrual influence on the normal results.

Moreover, clinically, it is important for us to realize that the metabolic rate varies according to the menstrual cycles. No rate of a woman should be quoted without a record of the probable pre-menstrual and post-menstrual intervals. It is interesting to know that literature contains records of hyperthyroidism which is present only at menstruation. Such cases might have a post-menstrual rate of +8 to +12% and a pre-menstrual rate of +20 to +30%, and unless the symptomology were definite the diagnosis might be missed if only the post-menstrual rate were taken. A hypothyroid case might likewise be overlooked, if a pre-menstrual rate of —14 to —10% were obtained. Of course the clinical manifestations are in all cases of the greatest importance.

Nearly every woman, whether normal or abnormal, has a menstrual history suggestive of a heightened metabolic rate before her menstrual period. Frequently there is emotional instability, excessive nervousness, some sensations of heat and even slight increase in perspiration. Such a record of increased thyroid activity with menstruation is cited.

Mrs. H., age 42, married, has had typical symptoms of exophthalmic goiter for two years. Her rate at present is +54% and she has marked signs of hypertrophy and decompensation of the heart. Her thyroid enlarges and goiter becomes painful for three or four days before her menstruation sets in and as soon as the period starts she gets relief. She can tell when her period is coming by the pain and swelling in her neck.

VARIATIONS IN THE METABOLIC RATE DURING PREGNANCY.

Many clinical facts point to the increased activity of the thyroid during pregnacy. Lange, in 1899, was the first to point out the usual enlargement of the thyroid which occurs in pregnancy, and thought that where no hypertrophy occurred, toxaemia was apt to result. Obstetricians have confirmed this observation, but not his idea as to the cause of toxaemias, and they find hypertrophy occurring usually after the sixth month. De Lee and Williams both state that hyperthyroidism may develop in pregnancy, and Osler says that pregnancy may cause the disappearance of myxedematous symptoms, which symptoms may reappear after delivery. Certain surgeons, Bear writes, are afraid to remove as much thyroid in the pregnant as in the non-pregnant woman. Finally, obstetricians report increased pulse rates, moister skin, slight mental irritability, and certain other symptoms, which would point to increased thyroid activity during gestation.

We are now investigating the metabolism curves in pregnant women and hope to have some definite information on this subject at a later date.

One patient has been observed already from the fifth to the eighth months of her pregnancy. The curve is shown in Series B, at this time, only because of the apparent corroboration of the clinical impression that thyroid activity increases during the last months of pregnancy. The chart shows a progressive rise in the level of the metabolic rate after the fifth month. If subsequent work should substantiate this curve, it would be most interesting to determine the exact cause for such increased metabolic activity. It is interesting that Murlin and Carpenter, in 1911, decided from a study of three pregnant women during the ninth month of pregnancy, that the energy metabolism of the pregnant woman is specifically higher than that of women in complete sexual rest.

DAILY VARIATION IN METABOLISM IN MEN.

The possibility of variations in the metabolic rate of men which may be associated with a possible cyclic fluctuation in the sexual gland activity of the male similar to that existent in the female comes to our mind. Such a sexual cycle in the male has been suspected by many psychologists, but no method of obtaining an idea of sexual gland activity has existed heretofore. Through our studies on the effect of menstruation on the metabolic rates, however, we now feel that sexual gland activity can possibly be indirectly estimated by the study of the metabolic curve in the female and possibly in the male also. We are, therefore, at the present time doing frequent metabolic tests on several male subjects, hoping thereby to obtain data which will indicate whether such fluctuations in sexual gland activity do exist in the male.

Two curves are produced at the present time in Series C, though no claim as to their value is made. Both seem to show a three to four weekly rise similar to that observed in the pre-menstrual period of women. Both curves are greatly heightened toward the end of the second month, this being due to the undoubted uncontrollable excitement resulting from the collegiate boat race in which Subject 1 was a participant. Mental excitement is thus shown to be a possible factor in the raising of the metabolic rate.

In reviewing the normals which Benedict has used for men, one subject was found to have had 53 metabolic tests done at very frequent intervals. We have plotted these results graphically in Chart 10, and very suggestive rises in the metabolism level at rather definite monthly intervals are brought out. Benedict was unable to explain these fluctuations except by the effect of unusually cold weather. The possibility of a cyclic variation in the metabolism of men evidently has not occurred to Benedict as an explanation for these variations. We realize that our work on the male is little better than a hypothesis. However, we have demonstrated that normal changes in the metabolism level, such as Benedict found, do exist and they

must be explained in some way, and must be taken into account by those doing basal metabolic work.

SUMMARY.

1. All metabolic rates are probably influenced by sexual gland activity.
2. The menstrual cycle produces a definite metabolic curve in women, the highest point being in the pre-menstrual week.
3. It is possible that the metabolic rate gradually rises during the last months of pregnancy.
4. There may be a metabolic curve in men associated with a possible sexual gland cycle in that sex.
5. We hope that this article may help to point out certain problems which are important in the establishment of accurate normal standards of basal metabolism.

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TICS, AND THEIR TREATMENT*

By THOS. C. LITTLE, M. D., San Diego.

My object in presenting to you these studies is three-fold: First, to show the clinical facts connected with the case, which are of themselves of intrinsic value; second, to give the tics their proper place among the motor affections of nervous disease, and third, to study the avenue of approach for their correction.

The word tic has been so misused, and the significance so varied in interpretation, that in the discussion there must be a definite conception of the scope and use of the term.

Tics, then, will be limited in our use to a mental condition which exhibits non-painful motor phenomena outside of the radius of the conscious, consisting of an abrupt momentary muscular contraction, more or less limited, involving the face, neck, trunk or limbs. A pathological habit, the stimulus being ideation, originating in a cortical reflex, whose expression is a motor reaction.

Spasm is most frequently confounded with tic. It consists of the same reaction, from the motor standpoint, but lacks the essential central stimulus in reaction.

CASE REPORT

Harry A., age 23, first studied in 1905, a dentist by occupation.

Father died at 42 of alcoholic nephritis. He was an inmate of a Keeley Institute at three different times and was classed as a dipsomaniac. His mother is 58, and has had migraine since six years of age.

One paternal aunt had spasms—Tic (?); one maternal aunt an epileptic, and another a sufferer from migraine.

Patient's grandfather died at 51 of apoplexy. Two brothers are living. One is 31, a doctor and a drug user. The other is 28 and an apoplectic. Two brothers died in infancy. One sister is living. She is 25, married, and suffers from hysteria.

Our patient had what was accepted as St. Vitus Dance during childhood, and at 12 was "glassed" for a blinking spasms (?).

At 18 he lost the use of his left hand for three months as the result of maintaining himself in the water in an overturned boat for an hour. He graduated in dentistry at 22 and began practice. For about three months previous it was noticed that he turned his head to the right at regular intervals. He explained this as being a movement which he executed in his work at the dental chair. At the time he came under observation the tic had become a fixed habit, appearing about every half hour.

Here, then, is a tic springing from an occupational movement. The patient is unable to concentrate on his work, his will passing from the matter in hand to the movement of his head. Repetition has changed a voluntary act into an automatic habit.

Voluntary movement of the head, reinforced by strict attention to modified Brissand exercises, with re-education, corrected the habit within six months.

He was under observation for a year and then went to a distant city.

During the winter of 1918 he had influenza, with considerable involvement of the throat, and developed a tic of the larynx, which consisted in gurgling noises appaearing with each six or seven inspirations and extended over the time of two normal respiratory periods.

In November, 1919, he again came under observation and he was put on a system of breathing exercises modified from the Brissand. The treatment relieved him and corrected his habit within three months.

The patient has a son eight years old with a (Blephonic) tic.

The case of Harry A. is selected as a prototype because the man is, and has been during his life, in many ways above the average, physically and mentally; hence, in the discussion one is not annoyed by the recurrent thought of degenerative changes, and by response to training he has shown a mental twist, not a mental disease.

The motor part of the tic was originally directed to a definite object, provoked by a definite cause, and the disappearance of this cause does not justify the conclusion that it had not existed.

In my studys of tics during the past twenty years there is no record of their development except upon soil prepared by psychical predisposition. The exciting causes depend entirely on circumstances surrounding the individual and, while one is able as a rule to ascertain the initial cause, yet, owing to the tendency of the subjects to flights of imagination and a fantastic picture of themselves, it is by no means always easy to tell the true from the false.

Tics may occur at any age except infancy. It is the development of the psychical function at about eight years that revelation of its imperfections, if such exist, becomes possible.

Heredity is of common occurrence. To this Charcot attaches the greatest importance. The

* Read before the Fiftieth Annual Meeting of the Medical Society of the State of California, San Diego, May, 1921.

literature abounds with examples. Gintrac's cases, two brothers had similar tics. Blache's patients were three children in the same family. A father and two sons, of whom Latulle has given an account, were blinkers. Meigh and Feindel describe O.s tic and carry it through three generations.

Dissimilar heredity in any form, neuropathic or psychopathic, is no less frequently met with, and emphasizes the association of tic with all the psychoses and neuroses.

It is a matter of general observation for a Tignieur's father to be an alcoholic, his mother neurotic, brother or sister an epileptic or migrain, with grandparents suffering with a neuroses or psychoses.

It is a matter of further observation of tic that in the families mental instability and intellectual superiority have been repeatedly conjoined.

Of the pathological anatomy of tic we have no knowledge. Postmortem examinations of the subject have shown no changes.

Negative findings do not preclude organic changes, and probably further study under different methods will throw some light on the subject; but at present, as with numbers of the neuroses and psychoses, our observations are limited to the symptoms.

Tic, then, is a psycho-motor affection and two inseparable elements unite into its constitution—a mental defect and a motor defect.

The attitude of the mind, which shows the prevailing defect is the will, which takes the form of either volitional debility or volitional versatility, this being characteristic of the mind of a child and, continued for years, shows partially arrested mental development; hence, "infantile" describes the patient's mental state. Speaking generally, a degree of mental instability is the distinguishing feature of a patient suffering from tic.

The motor defect is the result of a motor reaction, the stimulus being an idea. The types of tic are innumerable, depending only on the variation of ideas which can be expressed through the motor apparatus.

In some instances tics are commonly held to be an affection of no moment and again notoriously rebellious to any line of treatment. Either extreme is not fair. As far as life itself is concerned, they are of no menment; but they render its living often intolerable and some degree at least of relief is obtainable. These sufferers should have our attention.

Practically all medicinal agents used in the treatment of nervous and mental diseases have been used in the tics and all have proven their worthlessness. Medicinal, electrical, hydro-therapeutic, surgical and suggestion have all been tried and failed.

In 1851 Blache's use of medicinal gymnastics in abnormal chorea was attended with excellent results; the principle used being the regular execution of given movements by the group affected to the movements of the pendulum of a clock.

This forecasts the modern methods of re-education now so successfully employed to combat tic, which appeals to the intelligence, good sense and will of the patient to provoke an inverse effort at the moment when the tic begins. The credit of establishing treatment by forced immobility is due to Brissand, who, in 1893, devised a method of motor discipline for cases of mental torticollis with most gratifying results. This consisted in a continuation of the discipline of the movements with a discipline of immobilization; the idea being to cause to be performed slow, regular, accurate movements to order, bringing into play the muscles of the area in which the tic is localized and at the same time modifying the activities of all other muscles of the body. All movements should be made before a mirror. It must be borne in mind that the exercises should be graduated, and at no time should the fatigue point be reached. Even the most insignificant gain will rapidly grow, provided the patient's attention is not overtired.

Preceding each drill or exercise a few moments should be devoted to frank and open conference, lucid and sincere explanations, patience, courage and interest on the part of the medical adviser, teaching faith and perseverance on the patient's part. With this course maintained the victim of tic will speedily unlearn his bad habits and, in addition, learn not to take on new bad habits; the result being beneficial, both physically and mentally.

CHRONIC TROCHANTERIC BURSITIS *

By J. K. SWINDT, M. D., Pomona, Cal.

Inflammation of the bursæ, situated about the great trochanter, constitute one of the most commonly overlooked lesions peculiar to this region. Subacromial bursitis, which, of course, is more frequent, has been studied and written about more extensively, has not received the attention of the practitioner which its surgical importance should command. Trochanteric bursitis, being much rarer, is still oftener not thought of until an extensive chronic lesion is present, which may severely tax the surgeon's dexterity and subject the patient to a prolonged invalidism before cure is accomplished.

Bursæ are not stable anatomic structures, only the larger ones being constantly present at birth and many smaller ones developing as the need for them arises in the course of the exigencies of special stress over bony prominences. They do not all conform to one structural type, but present every gradation from simple enlarged areolar spaces with no endothelial lining at all, to definite serous sacs, with distinct synovial-like lining membranes, well-defined fibrous walls and characteristic fluid. The deeper bursæ are more constant and completely developed structurally, while the superficial ones are least so. Of the latter many are adventitious, such as those which develop over a spinal prominence in Pott's disease or over the cuboid in talipes varus. Bursæ, whether normal or adventitious, deep or superficial, when unduly irritated, form bursal cysts or hygromata. All bursæ are liable to injury, acute and chronic in-

* Read before the Fiftieth Annual Meeting of the Medical Society of the State of California, Coronado, May, 1921.

flammation, tuberculous and syphilitic infiltration, and to neoplasms.

About the hip joint there are to be found from ten to thirty bursae, most of which are not constant and have not been distinguished by definite names by the anatomists.

Spalteholz's Hand Atlas describes the most important ones as follows:

Bursae trochanterica subcutanea, frequently present, small, just beneath the skin, upon the lateral surface of the trochanter major.

Bursa trochanterica m. glutaei maximi, constant, very large, upon the posterior and lateral surface of the trochanter major as well as upon the origin of the m. vastvis lateralis, between these and the upper portion of the m. glutaeus maximus.

Bursae glutaeo femorales, constant, two or three small bursae below the preceding; partly lateral, partly medial from the attachment of the m. glutaeus maximus to the femur.

Bursa trochanterica m. glutaei medii posterior, very frequently present, between the tendon of the m. glutaeus medius and the tendon of the m. piriformis.

Bursa trochanterica m. glutaei medii anterior, constant, sometimes double; between the tendon of the m. glutaeus medius and the apex of the trochanter major.

Bursa m. piriformis, frequently present, in front of and below the m. piriformis, between it, the bone and the m. gemellus superior.

Bursa m. obturatoris interni, constant, between the incisura ischiadica minor and the m. obturator internus; it is very often continued into the groove formed by the mm. gemelli, for which it forms a lining; the latter part is very rarely independent.

Bursa m. bicipitis femoris superior, inconstant, between the tendons of the mm. biceps and semitendinosus on the one hand, and the tendon of the m. semi-membranosus on the other.

Bursa ischiadica m. glutaei maximi, very frequently present; upon the posterior surface of the tuber ischiadicum and of the origins of the mm. biceps and semitendinosus, between these and the m. glutaeus maximus.

The most common site of bursitis is the prepatellar bursa, familiar as housemaid's knee, next the olecranon bursa, and then the subacromial. Bursitides of the lower extremity, next in order, are relatively rare, especially those about the great trochanter. Of the latter, those of the glutaeus maximus muscle are the most frequently involved as a result of their relation to the great trochanter, and the frequency of traumatism to this part of the body.

Traumatism seems to be the chief factor in the etiology of bursitis. Violence applied directly over the bursa, or indirectly applied through violent contraction of the muscle, whose tendon overrides the bursa, crushes the bursa against the underlying bone and produces an acute bursitis. Prolonged irritation induced by occupation overuse, as in housemaid's knee or weaver's bottom, produces a chronic bursitis.

Infection is the second factor in etiology and is usually secondary to traumatism. Inasmuch as the bursa is practically never penetrated by trauma, it must be concluded that the infection is metastatic in origin. Moreover, a bursa forms an ideal cultivation ground for bacteria. It has long been known that inflammations of the bursae about the heel are particularly apt to be metastatic from gonorrhoea, and it is now felt that infectious bursitis, like arthritis and osteomyelitis, is metastatic from acute or chronic focal infections such as pharyngitis, tnsilitis, furunculosis, etc. Syphilis, tuberculosis and gout are constitutional maladies which localize occasionally in bursae. Secretion of an excess of fluid and the consequent burrowing tendency of the hygroma are the dominant features in the pathology of bursitis.

Murphy says that "the fluid which is discharged is collagenous in nature. The slowly developing collagen forms a membrane resembling the synovial membrane, covered with flat cells of the cicatricial type, resembling endothelial cells, but they are not endothelial cells. The fluid resembles the synovial fluid, but contains collagen.

The bursa formation is due to the absorption of the fatty tissue and the development of collagen. In the development of new joints it is the application of this principle that gives us movable joints. The result of this degenerative or absorptive process in fatty tissue, with hyperplasia of the connective tissue element, is the hygroma. These hygromata are lined with flattened cells, endothelial-like cells, but do not contain fluid under normal conditions, only under pathological conditions" (Clinics, Vol. II, No. ii).

Under tension a traumatized or infected bursa ruptures at its thinnest point and burrows in various directions between the fascial planes. Fusion with the neighboring bursae may result in a whole chain of bursae uniting to form a single cavity with a continuous flat-cell lining. The burrowing process having established communication with an associated joint cavity, incomplete excision of the bursa may be followed by its regeneration from the synovial membrane, in which case extirpation is most difficult. Infected bursae untreated eventually rupture through the skin. A fistula thus established, or that which follows incision or incomplete ablation of the bursal sac, is exceedingly prone to remain open and continue indefinitely to discharge the synovial-like secretion of the bursa or the regenerated hygroma. Necrosis of the bone is extremely rare and only occurs in long-neglected purulent cases.

In long-standing bursitis the walls of the hygroma may become considerably thickened. Plastic infiltration may extend into the surrounding fibrous and muscular structures, to which may be added calcareous deposits which greatly increase the fixation of the joint. Disuse of the muscles involved results in atrophy. Occasionally rice-like bodies arise by exfoliation of circumscribed hyaline necrotic patches from the wall of the hygroma or from fibrin deposited from the edudate. Rice bodies usually indicate tuberculosis, and are often palpable through the walls of the tumor. In syphilis a marked thickening of the walls of the bursa occurs with a small effusion and often the skin and other adjacent tissues are invaded by the gummatous infiltration.

A knowledge of the location and possible pathology of bursae may afford an explanation of many cases of obscure pain following violent exercises such as climbing, boxing, tennis and football or unusual exertion in rescuing oneself from sudden falls. Bursitis should always be thought

of in deep-seated abscesses of vague origin, especially in the vicinity of joints.

The classic history of an infection in the great trochanteric bursa is that it slowly advances, very rarely appears rapidly, and very rarely arises as an acute metastatic infection following trauma. In beginning inflammation tenderness is present over the site of the bursa. Pain is experienced on movements of the limb, especially voluntary external rotation; this pain is greatly augmented when the limb is held firmly in counter-rotation by the examiner. The characteristic attitude of the limb is in flexion, abduction, and external rotation, the position which best relaxes the aponeurosis of the glutaes maximus and tensor fascia femoris. An elastic tumor develops posterior to the trochanter, underneath the aponeurosis of the glutaes maximus, which obliterates the hollow behind the trochanter. Large tumors may be divided by the gluteal fold, or this fold may be obliterated. The tumor may extend from the ischium to the femoral canal and from the crest of the ileum to the external condyle of the femur. Pressure on the sciatic nerve may produce pain along the course of this nerve. There is an absence of swelling in the hip joint, and the head of the femur can be rotated in the acetabulum without pain. Differential diagnosis is to be made between trochanteric bursitis and inflammation of other bursae about the hip, coxitis, and osteomyelitis.

Bursitis about the hip, other than trochanteric, should be differentiated at least in early stages by the anatomical situation of the tumor, eliciting of pain by voluntary contraction of the muscle overriding the bursa, and nerve involvement. When the gluteofemoral bursae are inflamed, the tumor, pain and tenderness will be just above the lower edge of the glutaes at its insertion into the femur and below the trochanter. Ischio-gluteal bursitis is easily distinguished by the location of the tumor, great discomfort in sitting and pain and functional disturbance in the area of distribution of the inferior pudendal nerve, the perineum and external genitalia. Four bursae, two under the gluteus medius, one under the minimus and one at the edge of the piriformis, are closely associated and particularly related to the summit of the great trochanter. Symptoms from these are lesss pronounced than from the great bursa and point above the trochanter. Ischio-obturator bursitis quite closely resembles coxitis, but may be detected by tenderness upon rectal examination and negative test movements for hip joint disease.

The tumor in ileo-pectineal bursitis presents at Scarpa's triangle, may extend to the inguinal canal, and is very apt to produce pain in the area supplied by the femoral nerve. Extension of the thigh increases and flexion relieves the pain. In coxitis test movements of the joint are painful, jarring of the joint is painful, and there is the characteristic abductor spasm, none of which are present in bursitis. There is no tenderness over the bursa. Scar tissue of suppurative bursitis may limit the mobility of the joint to an extent which closely resembles coxitis, and invasion of the joint cavity may still further complicate the diagnosis, rendering it difficult even at operation or autopsy. In some cases the X-ray is of vital importance. Stereoscopic pictures should be taken after the injection of Beck's paste or other opaque media through a spontaneous or artificial sinus. Such pictures are of the greatest value in determining the operative procedure in any form of bursitis.

Osteo-myelitis of the trochanter begins with a more violent onset locally and constitutionally, and metastatic infection quickly follows the traumatism. The skeletal lesion is easily discernable by the X-ray. It is to be remembered that bursitis may complicate an osteo-myelitis.

There is only one method of treatment for chronic trochanteric bursitis; that is absolute complete removal of the entire bursal sac. Every niche and corner of its ramifications must be totally dissected away or the whole structure will be regenerated. Let me quote Murphy's picturesque description of this condition. In a clinic on "Painful Exostosis of the Os Calcis" (June, 1915), he says:

"Pain just like this is seen on pressure over bursitides elsewhere such as the not infrequent bursitis occurring in the deep bursa over the great trochanter. Have you ever seen a case of chronic bursitis in the trochanter region? If you have had one to treat you will probably remember it as long as you live. At first there seems to be only a small quantity of fluid just over the bony prominence. The patient complains of occasional or frequent pain over the bursa when the fascia is put on the stretch, and the spot is extremely sensitive to pressure. It looks like a small undertaking, so you operate and remove it. Very likely you find rice bodies in it, and after you have completed your dissection you tell the patient he is cured; but he is not cured—in all likelihood he is just beginning. The affection comes back in two months or more. You operate again, making up your mind that you must have left a portion of the bursa before. You tell the patient, 'Well, this time I got it all.' But, again it comes back. Usually, you operate until you get some little experience with this particular lesion. Finally, in desperation, you start your incision somewhere near the anterior iliac spine and dissect down to somewhere near the external condyle of the femur, removing everything in sight that looks like a bursa or looks as if it might develop into one; and thus at last you extirpate the disease."

Case: Unmarried woman, twenty-seven years old. Family and personal history negative, except since the age of ten patient has suffered from repeated attacks of acute tonsilitis, usually followed by multiple arthritis. Tonsillectomy at twenty-three afforded relief from arthritis for several years, after which frequent attacks of pharyngitis ushered in more joint troubles.

September, 1919, caught right heel in a defective sidewalk and fell with leg sharply flexed on thigh, severely wrenching the foot and hip. For the next four months pain in the hip and foot gradually increased. The foot symptoms predominating led to an X-ray of it in January, which revealed marked arthritic changes about the tarsal bones. In April, after a severe cold, pain in the foot and hip again became worse, and for the first time pain on the inner surface of the thigh was

noticed. In June a swelling on the outer aspect of the thigh appeared, extending from the trochanter to the mid thigh, with redness over the trochanter. By this time walking was quite difficult, and patient experienced another fall early in July, striking directly on the right hip. This was followed by a marked haemorrhagic discoloration of the tumor, and symptoms which confined her to bed one week. July 4, an X-ray of the hip revealed no bony pathology, and neoplasm was diagnosed by attending surgeon. In August, Dr. A. V. Stoughton, of Claremont, obtained a syringeful of grayish-white pus by aspiration and referred the case to the writer.

At this time patient complained of pain about the hip and thigh, fever and sweats, a loss of eleven pounds in weight and a tumor, which was plainly noticeable through the clothing. The leg was held in flexion abduction and external rotation. Temperature, 101.5; leucocytosis, 1000; haemoglobin, 70 per cent. A fluctuating tumor extended from above the trochanter to the lower third of the femur. Stereo radiographs revealed no pathology in lumbar spine, sacro-iliac joint, ileum nor femur. Hip joint pain tests negative; voluntary efforts at external rotation against resistance were extremely painful.

September 17, 1920, under novocain anaesthesia a long vertical incision was made over the tumor and a huge cavity opened, which contained half a pint of flocculent fluid. The cavity was lined by smooth, shiny membrane, over which was deposited a thick layer of soft grumous material. Through a three-inch slit in the fascia lata in front of the trochanter, the cavity above the fascia communicated with a similar cavity beneath the fascia and encircling the trochanter. The superficial portion of the hygroma was removed en masse by dissection, and the walls of the deeper portion vigorously curetted with a sharp curet, and drainage established. The wound healed, with a fistula remaining, which continued to discharge synovial-like fluid for two months. At this time the cavity was filled with Beck's paste, and the stereoskiagram showed it to be of the same extent and distribution as found at operation.

November 18, under ether anaesthesia, the former incision was reopened and enlarged to extend four inches above the trochanter and eight inches below. Again, the cavity was found lined with a well-defined shiny membrane. Turning back the skin margins a long incision in the directon of its fibers was made through the tendinous part of the glutaeus maximus. At the trochanter this incision was turned downward at a right angle and extended along the posterior margin of the ileotibial band to the lower end of the cavity between the fascia lata and the muscle vastus lateralis. The slit in the fascia lata, noticed at the first operation, was extended upward about four inches above the trochanter. These incisions designed to preserve the integrity of the tendons and faseia, afforded access to all the bursae in the vicinity of the trochanter.

By retraction and eversion of the flaps, the remains of the deep trochanteric bursa, and the bursa gluteofemorales were dissected out. The sharp dissection was then extended over the inner surface of the glutaeus medius, piriformis, gemelli and quadratus femoris as far as the membrane extended. Anteriorly, the dissection was carried as far as the bursa pertinata, which was found intact and not fused with the pus cavity.

The incisions in the fascia lata and gulaeus maximus were closed, leaving drainage through to the site of the trochanteric bursa. Drains were removed on the third day, and the wound healed by primary union on the fourteenth day. Walking was permitted on the twenty-first day. As a result of the incision as described, no stiffening of the muscles resulted, and perfect freedom of motion was obtained.

MENINGITIC EPILEPSY.*

By CECIL E. REYNOLDS, M. D., D. P. H., Los Angeles

Epilepsy is no longer generally regarded as a disease, but rather as a symptom of many conditions, some well known, some little known and some not known at all.

The first thing that occurs to one in regard to the epileptic phenomenon is that it has biological significance, just as pleural effusion has the protective purpose of separating the inflamed pleura, etc.

If, therefore, the epileptic convulsion has a purpose we must consider what the convulsion achieves and why.

What we observe is a change of respiration, followed by bodily rigidity or movement, or both in succession and usually an enforced recumbent posture. Very often, also, there is unconsciousness.

The result of all this is, firstly, a diminished flow of blood away from the brain, and, secondly, a rise of arterial pressure.

The effect of this must necessarily be an enforced dilation of the arterioles of the brain.

This is the state of affairs described by the late Sir Victor Horsley in a lecture on Epilepsy (British Medical Journal, April, 1892), in which he scouted the theory that epilepsy is due to a spasm of the cerebral arterioles, but that the condition was rather that of hyperæmia. But I most particularly draw attention to the fact that he spoke of what he observed during an attack and I have been unable to find any reference of his to the condition of the arterioles prior to the attack.

In favor of the contrary view that the convulsion is due to a spasm of the cerebral arterioles producing starvation of the cortex which the fit endeavors to correct, I refer you to the mass of evidence published by Dr. A. E. Russell in the Goulstonian Lectures Lancet, April 3, 10, 17, 1909. Also Dr. A. E. Stoddart's observation of the co-existence of epilepsy with Raynaud's disease, and I believe that Dr. Harvey Cushing made similar observations under his glass trephine windows, but of this I have no definite information.

A number of observers, notably Knies and D'Abund, have reported arteriospasm of the retinal vessels immediately preceding an attack, and hyperæmia of the same later in the attack, but one of the most valuable of modern observations was made by R. Leriche and reported in the Presse Medicale of Paris, September 15. 1920.

Leriche had a cerebral cortex exposed at the moment of onset of a Jacksonian fit and was much impressed by the sudden arteriospasm and pronounced anæmia of the cortex. This anæmia obviously cannot continue in the face of the enormous subsequent engorgement, and I presume that when the arterioles have been thoroughly distended and perhaps temporarily paralyzed, the fit passes off.

It is a matter of common observation that the face becomes pale at the onset of a fit, and also

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during an ordinary faint in non-epileptics twitchings may occur and even a typical convulsion develop. I have observed fits to occur during the administration of nitrous oxide both in the reputed healthy and in the known epileptic, and fits are the invariable accompaniment of asphyxia. So that the ultimate purpose of the fit would appear to overcome oxygen starvation of the brain. Fits are common in pernicious anæmia in its later stages when there is decided anoxæmia.

There is nothing in our physiological knowledge to refute the probability that Nature must adopt this violent and indirect method of overcoming oxygen starvation of the brain due to arteriospasm. We know of no direct power of the cortex over the vasomotor centre, other than that certain persons can blanch their arms by an effort of will, but as great muscular rigidity of the arm appears to be necessary to the accomplishment, it is possible that such persons have a cervical rib against which they can compress the subclavian artery.

Horsley divided the mesencephalon and found that the blood-pressure still rose when the general pressure on the cortex was increased, thereby showing that in this case the rise of blood-pressure was not due to any messages from the cortex to the vasomotor centre via the cerebral peduncles.

If the fit is not a vascular phenomenon but merely an explosion such as would occur when a match is applied to gunpowder, I see no reason why it should ever cease until all the gunpowder (meaning the cortical substance) is exploded. In such a case every fit would terminate in status epilepticus until death. Brown-Sequard produced convulsions of the legs by compression of the aorta. Herman produced convulsions by ligaturing veins from the head; this, however, raised the general intracranial pressure. So that the balance of evidence, I believe, is that the onset of the fit is marked by cerebral anæmia, the blood-pressure rises until a certain degree of hyperæmia is attained, and the fit passes off, leaving varying degrees of temporary exhaustion paresis.

The passing of the fit can be most quickly induced by a few whiffs of chloroform, which is initially a strong dilator of the cerebral arterioles. Likewise, cases that have a warning can often prevent a fit by taking half an ounce of whisky in water, by reason of its vasodilating power, and after a fit whisky will restore the faculties twice as rapidly.

Between fits there is, no doubt, that epileptics should abstain as a rule, but even this may depend upon the etiology, since whisky neutralizes some toxins.

Both Oppenheim and Diefendorf state that when fits have been long absent in a so-called "idiopathic" case, the occurrence of an attack clears the patient's mental atmosphere. Oppenheim also mentions the frequency of fits in aortic stenosis, bradycardia and arterio-sclerosis.

In Leriche's case of Jacksonian epilepsy, above referred to, in which he saw a spasm of the cerebral arterioles at the onset of a fit, he also observed that the humeral artery at the same time was greatly dilated in Jacksonian epilepsy of the arm, and repeated the common observation that a tight band around the affected limb will abort an attack.

These observations all tend to indicate that the study of the symptom "epilepsy" is resolving itself into a study of the sympathetic nervous system and the effect upon it of the following factors:

1. Hereditary degeneration.
2. Toxins endo-and-exo.
3. Abnormal intracranial conditions in otherwise healthy individuals.
4. Abnormal psychology which may be of environmental origin and in which there is a discharge of energy direct from the affective sphere into the motor centres without any regulating intervention of the noetic consciousness which should convert the energy into conduct.

It is only with a limited part of factor number three that this paper should be concerned.

Undoubtedly heredity plays a great part in many cases since Spratling found parental epilepsy in 16 per cent in a series of 1070 cases.

The next least disputed conditions are the gross cortical lesion, such as tumor and the toxic.

The gross lesion, such as tumor, produces fits in the limb corresponding to the piece of cortex upon which it presses until the general increase of intracranial pressure produces convulsions so general that the Jacksonian fit becomes less individual. By this time the original spasming centre is declining into paralysis and as the paralysis increases the Jacksonian fit lessens, because that part of the brain is losing its "kick," and its fight for nourishment has failed.

Conversely, we observe that after successful operation, the paretic limb or speech centre improves in jumps after each post-operative fit until the fits cease altogether, when the maximum comeback has been attained. I will show slides of cases in which this was well demonstrated. The best illustration of the toxic etiology is seen in eclampsia and uræmia, but this type of etiology can be produced at will by the injection into a vein of a few drops of absinthe. This fact should facilitate the investigation of the autonomic mechanism in toxic epilepsy.

Closely allied to the toxic is the obscure field of glandular secretions. Suspicion has long been directed to the thyroid, the parathyroids, the ovary and the colon, but the recent work of Fischer has shown that removal of the suprarenals diminishes the susceptibility to convulsions and reduces muscle-tonus. Bruening reports in the Zentralblatt fur Chirurgie, October, 1920, that he has accordingly operated upon nine unselected cases, removing the left adrenal and apparently cured two and improved the rest.

Fischer makes the somewhat sweeping statement that the central nervous system plays a subsidiary role in epilepsy and considers the sympathetic and endocrine systems as of prime importance.

It is to be hoped that adrenalectomy will not become as fashionable as colectomy and ovariotomy seem to be in the treatment of epilepsy without

grave consideration, for all these operations are far more serious than the subtemporal and suboccipital deduralizations, or the Rolandic valve-flap operation.

These various cranial operations I have performed upon thirty-nine selected cases of epilepsy. Of these, ten cases of grand mal have been apparently cured (the longest cure has been eight years and the longest duration of fits before operation was every night for twenty years). Five cases of psychic equivalents also cured and one case cured could only be classed as tetanoid spasm. Of the other cases, eight are very promising but too recent to form an opinion, twelve grade from very great improvement to slight improvement, and three are dead. Two of the dead were complete idiots from extreme occult hydrocephalus, the other had Bright's disease and gross arachnoiditis. In only one of these thirty-nine selected cases did I fail to find gross and obvious disease of the cerebral or cerebellar membranes, and that case had excess of subdural fluid not under pressure covering a very pale cortex with constricted vessels, the result of an endocrine influence. This patient is highly intellectual.

Only two of the series had a positive Wassermann, and both are now well. Eight of these cases have exhibited themselves since cure before the Los Angeles County Medical Association, the Southern California Medical Society, or the L. A. Neurological Society.

Syphilis, when present, may act in several ways to produce fits—by means of direct invasion of the meninges and neuroglia by spirochætes, by endarteritis, and by the spirochætoxin—especially when liberated by salvarsan. The worst status epilepticus I have seen followed injections of salvarsan in a case of early secondary syphilis.

Excluding, therefore, the two cases in my series with positive Wassermann reactions, the onset of the epilepsy followed mainly these diseases with astonishing directness and promptitude:

Tonsillitis, including tonsillectomy in the acute stages; diptheria, scarlet fever, whooping cough, typhoid, measles, mumps and gonorrhœa.

Two cases had a history of trauma which, without skull fracture, can cause chronic arachnoiditis when the initial arachnoid œdema subsides. The tonsil seems to be the worst offender, however, and in this connection it is well to recollect the relation of the ascending pharyngeal artery to the tonsil and to the basal meninges.

In addition to the above cases, I have operated upon numerous examples of the closely allied condition of vertical polio-encephalitis, that had caused imbecility and often athetosis without fits, with distinct gain.

When chronic meningitis follows the diseases enumerated above it causes fits in one of four ways. Either there is a thickened arachnoid over the vertex that looks like a cobweb or in places like melted butter, with or without cyst formation; or there are dry adhesions that have a propensity for picking out the vessels; or, there is a loss of absorbing power of the arachnoid lining the great cistern at the base so that cerebrospinal fluid collects in quantity sufficient to climb up over the vertex in amount more than is required to lubricate the brain in its pulsations, and by compression cause arteriospasm. When the tela is involved the fluid may be retained within the brain.

In the former case there are often physical signs and the fits are frequently coarsely Jacksonian, but in the last two conditions there are usually no more physical signs than in an undegenerate case of so-called "idiopathic" epilepsy. Usually, however, there are Jacksonian qualities shining through the general convulsion. It is unfortunate that this most curable form of epilepsy should so often remain unrecognized, and so seldom come to operation, as the usual medication with bromides and luminal causes rapid degeneration in them. I have applied the term "Occult" Hydrocephalus to this last mentioned class, as I think this name more accurately conveys the physical condition present and also is a reminder of the subtlety of the disease. The term, "Acquired Hydrocephalus," does not indicate whether it is manifest or occult.

When the fits have Jacksonian qualities in occult hydrocephalus they are usually right-sided in right-handed people (the head and eyes deviate to the right), and vice versa. The reason for this is probably that the most highly educated side of the brain, and therefore the most sensitive, rebels first when the pressure is very uniform. I do not wish to lay down an axiom that if the head and eyes go to the left in the fits of a right-handed person with a diagnosis of meningitic epilepsy that there is probably arachnoid thickening of the right fronto-parietal cortex rather than general fluid, but this has been my experience.

Of the physical signs in Occult Hydrocephalus, an alternating internal strabismus is by far the most constant and next in frequency is a facial paresis on the side innervated by the most highly educated hemisphere.

Unlike the strabismus, which is almost certainly due to a pull on the sixth nerves at the base, this facial paresis is, I believe, the direct result of the cortical pressure, although a widened palpebral fissure is far more constant than one used to expect in cortical lesions. Disc changes are inconstant.

If the palpebral fissure is widened without weakness of the mouth, as is quite common in many cases of epilepsy a few days or hours before an attack, great caution is needed in drawing conclusions therefrom, since it may be due to interference with one or other sympathetic cord by a toxin or other agency. I have three cases under observation at the present time who used regularly to present a marked transitory widening of the palpebral fissure on one side shortly before attacks. Two of these have been proved to be old meningitis, with abundant adhesions and pressure, and the other is unquestionably due to disordered function of the ovaries acting upon a perfectly healthy brain via the sympathetic. This latter case also had unequal pupils.

In occult hydrocephalus the pathological condi-

tion found at the vertex is usually excessive fluid in the subdural and subarachnoid spaces. This fluid is general in occult hydrocephalus and more or less local in encephalitis, for in the latter condition exposure of the frontal lobes will reveal considerable fluid in imbeciles (with pressure in favorable cases), but a more or less normal condition around the cerebellum and fourth ventricle; which is never the case in hydrocephalus.

The symptoms correspond. In occult hydrocephalus the disability of both mind and body is equal and only follows a fairly long course of convulsions as a rule; In encephalitis it is usual to see grave mental defect with perfect limb strength, with possible grimaces and athetoid movements, and a history of only a few fits or none at all. Often the disease commences with a delirium and fever or the onset may be fulminating and resemble a hæmorrhage. At other times the onset is insidious as occult hydrocephalus generally is. A hydrocephalus may be external, or internal, or combined.

The epilepsy due to external hydrocephalus without close adhesions to the pia mater is the easiest to cure.

A distinction between these three conditions cannot with certainty be made until the preliminary subtemporal opening is made. I always do this first as it is by far the safest method of toning down the intracranial pressure and of avoiding the complications of atmospheric pressure during the eventual suboccipital operation, especially if the fourth ventricle has then to be opened. Hydrocephalics take it very hard if their fluid is too suddenly released. Not only are the hydrostatics of the fourth ventricle upset, but the blood vessels of the brain cannot endure the sudden loss of support to which they have been so long accustomed.

When the hydrocephalus is internal, instead of fluid spurting out upon opening the dura the cortex bulges into the opening. When it is combined, fluid flows freely first and the cortex bulges out after it. In the vast majority of cases a little time or very gentle pressure upon the bulging cortex will cause a renewed flow of fluid and a recession of the brain to normal proportions. Normal brain never bulges.

If, however, there is no obvious subdural or subarachnoid fluid, but a dry brain bulges into the opening, it may be impossible to obtain a recession owing to a lack of communication between the ventricles and the subarachnoid space. This is less common in hydrocephalus not due to tumor, and unless due to tumor should not be treated by puncture of the lateral ventricle, which is a procedure bad in principle, and, from all I have heard, frequently unfortunate in practice. In either event, a cure will not likely be attained until a suboccipital deduralization has been done in the case of external, or a radical fourth ventricle operation in the internal internal variety, when the tela choroidea inferior may be found bulging like a toy balloon and devoid of pulsation. I have never attempted to interfere with the iter of Sylvius, and it has never apparently been called for. Nature frequently, by convulsions, bursts asunder all the membranous walls of the fourth ventricle (except the dura which is bulged), when they have become thickened and adherent, but unfortunately, owing to too long deferred surgery, the iter of Sylvius is woefully distended before this can occur.

The most favorable condition to find at the base in hydrocephalus is where the arachnoid has adhered to the dura and is separated from the intact pia by abundant fluid and the coverings of the fourth ventricles are still osmotic.

Very often, however, the tela choroidea inferior and its superimposed arachnoid are glued together and thickened and adherent to the deep aspect of the occipital sinus, being quite impervious or nearly so like the rest of the diseased membrane. It then has to be opened, when the occipital sinus is reflected. If now the iter is dilated a considerable fall of blood-pressure may be expected.

I am inclined to believe that Coupin, writing in the Societe de Biologie, Vol. 83, 1920, is correct in considering that the fluid passes out of the fourth ventricle normally by osmosis through the membranes, and that the foramina of Majendie, Key, and Retzius are anatomical artefacts.

In other cases not only have the posterior coverings of the fourth ventricle been destroyed, but the vermis pushed upwards and the lateral lobes aside by the prolonged pressure so that the rhomboid fossa is revealed as soon as the cerebellar dura is reflected. Even in this case the neck muscles will adequately take care of the fluid in time, provided the iter is not badly dilated.

In other cases the dura and arachnoid of the hemispheres have closely adhered to the cerebellum and its pia and are dissected off with difficulty. In such a case there is very little fluid at the base, but much at the vertex under pressure, and the convulsions are of the general type with occasional Jacksonian quality. Physical signs are likewise frequently absent. Conversely, when the fluid is most abundant at the base, the cerebellar element of the fit predominates and is most persistent, being usually a tonic emprosthotonus.

Turning again to vertical meningitis, when there is thickened arachnoid with cyst formation, the process acts as a foreign body constricting the vessels and producing local positive pressure, but when there are merely dry adhesions between the pia and arachnoid and dura the fits are frequently induced when the cerebrospinal fluid is under a negative pressure as occurs in fatigue, for then the brain contracts and, pulling on the adhesions that cannot leave the dura and skull, provides both an irritation and kinking of the vessels, for these adhesions select chiefly the sulci for their habitat. These fits are frequently Jacksonian in onset and preceded by violent neuralgic headache, moreover they are apt to occur at the end of the day in contrast to hydrocephalic fits, which are more apt to occur at night or very early morning, owing to accumulation of extra fluid that the

upright posture can take care of via the spinal theca.

In the case of arachnoid cysts they must be carefully dissected off in a two-stage operation, and I have occasionally found it necessary to puncture some blisters in the pia. As a rule, the pia must remain inviolate.

Adhesions must be carefully divided without sacrificing large vessels.

Some of the above points have been gleaned by making patients keep notes on the condition of the subtemporal openings, day by day. They are trained to record the bulging or collapse of the little hernia and the degree of pulsation.

In a serious disorder like epilepsy there is much to be said for an exploratory subtemporal in any case that is suspiciously meningitic. Providing the technique is ideal, it is a safety first measure. It should be absolutely safe except in hydrocephalus with extreme arteriosclerosis.

It may be a slight nuisance to men, but none to women, and it improves the general health of many cases and cures some without any other operation. It also saves the brain to some extent in future attacks. It is usually free from after-pain, and the stay in hospital need not exceed five days. I regard tonsillectomy with far more awe.

It gives more information than lumbar puncture, which is also useful in diagnosis, but probably more dangerous.

It always reveals an external hydrocephalus, and many an internal hydrocephalus declares itself to be uncomplicated by becoming external before closure of the temporal muscle. Frequently vertical adhesions can be seen even as low down as this, giving the information that an osteoplastic flap will be necessary higher up, so that a Krause valve flap may be made, subsequently. Moreover, a bilateral facial paresis, which not uncommonly exists and is quite unrecognizable, becomes unilateral after the subtemporal operation, that is after a right-sided operation the left mouth becomes surprisingly stronger, as proven by photographs taken before and after operation. Later the homolateral side of the mouth follows suit and the whole expression is altered for the better, and a gloomy looking person becomes bright in appearance. Another means of diagnosis, in the absence of those physical signs that we have been taught in early youth to rely upon in the diagnosis of organic disease, is "Dissection of Fit."

The art of fit-dissecting is still in its infancy, and is far more difficult in private practice than in an institution.

Of the *Jacksonian qualities* to observe, perhaps the most likely one to be caught is deviation of the head and eyes at the commencement of a fit. This is of more value in diagnosis than the subsequent behavior of the limbs unless the latter are very Jacksonian.

Of the *tonic stage* the meaning of opisthotonus is still debatable. It can arise from discharge of the trunk centres at the vertex, by discharge of the anterior vermis of the cerebellum, or it may be spinal, but in regard ot emprosthotonus I was most fortunate in being able to demonstrate in the Hanna case that it almost certainly arose from the posterior vermis of the cerebellum. The evidence for this was published in great detail in the California State Journal of Medicine, January, 1920. I have since obtained further confirmation of this in other cases of external hydrocephalus operated upon. The views of Hughlings Jackson, who first described cerebellar fits, have received additional confirmation this year from the pen of Purves Stewart in the British Medical Journal.

Tremor is probably more indicative of a basal fit and an aura of a cerebral point of commencement. However, a fit commencing in the cerebrum may yet be secondary to disease, principally around the cerebellum.

The presence after a fit of paresis or of mental clouding is indicative of the disturbance being in the cerebrum. A pure cerebellar fit is followed by no mental clouding or paresis, but after repeated cerebellar fits some ataxy and disturbance of past pointing can be detected.

As mentioned above, the time of day or night in which the fit occurs is also most important.

I know nothing of fits derived from the pons or basal ganglia, but there is much evidence that scars of large nerve trunks can excite epilepsy. In this connection it may be mentioned that Horsley found that after hemisection of the spinal cord, convulsions could be induced by stimulation of the sciatic of the hemisected side, and that this occurred whether the sympathetic was also divided or not. (Lancet, Nov. 20, 1886, p. 975).

As to whether there is such a thing as pure spinal epilepsy, and as to the influence of old poliomyelitis cervicalis in relation to some convulsions are questions for future research.

Since this is not a surgical meeting, this is no time to discuss matters of surgical technique, but it may be instructive to add that I have refrained from closing the dura mater in the last one hundred and twenty-one operations upon the brain and cord in all regions and have never seen any ill result therefrom, whereas the curative results in inflammatory lesions of both cord and brain have been highly gratifying. The total mortality has been eleven. Of these seven were idiot children from extreme hydrocephalus or encephalitis, two cases were eleventh-hour abscesses, one an epileptic with advanced chronic interstitial nephritis, and one adult hydrocephalic with advanced arteriosclerosis and ossification of the falx cerebri.

On the other hand, in cases in which the dura has been sewn up elsewhere and subsequently came to me for operation, I have found encysted fluid under pressure, and in one case also a large blood clot cavity in the lower Rolandic area.

In the subtemporal and suboccipital regions I convert the dura into intra-muscular drains; in other regions the dura is sometimes turned over the bone edges, before the central flap of dura is laid back upon the cortex and the osteoplastic flap replaced. This method in the prefrontal region has also been a complete success in a case referred to me by Dr. W. B. Kern, with a diagnosis of

Manic-depressive insanity following severe headaches of several years' standing. Dr. Kern suggested operation as a last resort before sending him to Patton, and since operation the patient has been quite free from pain, is very cheerful and facetious, and has returned to work. The facial expression has completely altered.

A similar case referred by Dr. Alfred Fellows has had identical relief from the same operation. Both cases were formerly suicidal.

Finally, in cases of long standing, it must not be assumed that in the event that the fits do not cease immediately after operation, the surgeon has failed in his object. The patient went down hill through fits, and he often must climb up again through fits; the diagnosis of progress rests on the question whether each post-operative fit improves or deteriorates the patient. If the latter, either a wrong diagnosis has been made or another operation is required.

The greater number of most illustrative cases have been referred to me for operation by the following doctors:

Alfred Fellows, J. Lee Hagadorn, F. L. Anton, C. P. Thomas, Leo Schroeder, H. W. Levengood, W. S. Mortensen, A. B. Hromadka, W. B. Kern, E. H. Jacobs, John Ferbert, G. P. Waller, W. Schuchwow, P. L. Barnes, H. C. Stinchfield, J. T. Stewart, W. L. Haworth, F. Leix, C. Shirey.

Since this paper was read, one of the patients classed as apparently cured because he had enjoyed nine months of perfect health after operation, whereas before he had fits every night for twenty years, did last month have two light attacks after working all day in the sun and breaking heavy sticks over the knee of the leg that started to convulse twenty years ago.

The results quoted above are purely surgical. None of the cures have had any drug treatment since operation, and although one or two of the improved have received small doses of sedative, this has been taken into consideration and discounted, as they were taking five times the dose before operation.

CHRONIC ARTHRITIS *

By SAMUEL J. HUNKIN, M. D., San Francisco, Cal.

You will note by the heading of this paper that I am not attempting a real scientific classification of the arthritides on a strict gross pathological or even a histological basis, believing that is not at present feasible. An attempt is made, however, to give a working scheme so that one may record his findings, reason regarding the various, sometimes typical characters noted, so that I may talk to you and you to me with a reasonable understanding of the conditions discussed.

We object to such terms as rheumatoid arthritis and osteitis deformans—to the former because it suggests rheumatism with whatever that implies, to the latter because the name implies that the deformity is of the essence of the disease instead of a measure of the inefficiency of the surgical procedure.

In our work, therefore, we classify—

First. Whether the changes are monarticular, multiarticular or general.

Second. Whether the changes are arthritic, osteitic or osteo-arthritic.

Third. As to the gross pathological changes which predominate.

(a) The bone, whether hypertrophic, atrophic, spurred or bridged, periostitic or destructive.

(b) The joint cavity, whether with plus fluid or minus fluid, with gelatinous thickening, blood, etc.

(c) The capsule, whether changed or unchanged, and if changed the physical character of the change.

Fourth. The etiological features, whether infectious, toxic, metabolic, etc.

The etiology is not always so simple as the foregoing seems to imply. Among those usually considered as infectious we recognize three groups, generally distinct—

(a) Those in which there is direct bacterial invasion;

(b) Those in which toxic substances, manufactured by bacteria, are the exciting cause; and

(c) Those in which the joint changes are associated with, and probably directly dependent upon the presence in the circulating media of a body, generally derived from organic sources. It is more than possible, also, that the peculiar character of the bone and joint changes may be due to variations in the offending bodies.

The analogue of (a) may be represented by direct streptococcic infection of joints, of (b) by the type of osteo-arthritis, which often develops in the back and in the finger joints of subjects suffering with pulmonary tuberculosis, and in which no tuberculous products are found directly associated with the changes. (c) may be represented by the effusion in and around joints, which occurs after the injection of antitoxin, typhoid vaccine, in urticaria, or in various other abnormal or diseased conditions. In our nomenclature, therefore, it is very easy for us to record *"monarticular arthritis with destructive changes plus free fluid and of probably infectious origin,"* with the character of the infection mentioned when determined, or, if not, what infection is suspected. This may seem a very lengthy nomenclature, but it very definitely expresses a condition which is easily recognizable and which is capable of ready discussion.

We believe, also (although we do not go so far in this direction as some members of this society), that various clinical appearances and pathological changes suggest definite etiological factors—for instance, a hypertrophic large joint type of disease with minus fluid, presenting rather massive joints, with a creak like a non-oiled piece of machinery, is definitely metabolic in origin. Another type, which especially involves the hip joints, although not so closely confined to them as is usually supposed, showing a definite tendency to mushrooming of the femoral heads, with the development of a peculiar buttressing of the acetabu-

* Read before the Fiftieth Annual Meeting of the Medical Society of the State of California, Coronado, May, 1921.

lar margins, we have learned to associate with toxic materials having their origin either in infectious processes in other parts of the body, or more often from morbid dietetics, or faulty metabolism. A type involving the large joints and more especially involving the vertebral column and hips, slowly developing, manifesting nodes, spurs and bridging, we also associate with metabolic or fermentative errors. The particular lesions found in this type appear to be originated and developed by any proteid body, circulating in the blood, whether this material be derived from bacterial infection or not. The development is certainly promoted by, if it does not often have its inception in, digestive disturbances, metabolic errors or habitual contact with and ingestion of dirt from any organic source, and especially when this is favored by bad sanitation and unhygienic surroundings. As a matter of fact, we have much clinical evidence to support the opinion that most of the chronic arthritides, even when frankly of a definite infectious origin, are stirred up, modified and often exacerbated by many materials of organic origin finding their way into the blood stream. The changes are probably also affected by non-organic materials, and certainly are affected by the bad habits of the individual, by bad hygiene, and by many barometric and climatic changes. It appears doubtful even whether any of the morbid agents, excepting those frankly bacterial, are directly blood contaminations. The chronic arthritides are so much more often associated with affections and diseases of the tonsils, mouth, gall bladder and dysentery than with septic and infected wounds; with ingestion of the offending bodies, than with blood stream contact with them, that it appears likely that the intestinal functions generally play a very important part. We are of the opinion that the advantages which may be derived in the chronic arthritides from attention to the teeth and tonsils are due almost solely to the improved hygiene and bettered sanitation of the mouth rather than to the removal of a specific focus which bore a specific casual relation to the bone pathology.

It is more than possible that many of the chronic arthritides are direct reactions of the bony, or joint structures, to a specific morbid entity in the organism which, while often derived directly from bacterial sources, are more generally not so derived; that the reaction is not specific for a bacterium, but is specific for a material; that the change is much more akin to anaphylaxis than to bacterial infection; that they have their analogues in asthma, hay fever and eczema, rather than in pneumonia and tuberculosis, much more akin to gout than to pyæmia. It is also worthy of note that while these changes are generally due to the long-continued action of these various morbid agents, ofttimes single or repeated large doses thrown into the circulation are followed by violent general reactions and local relief of both symptoms and the pathology of the joints. This relief, however, is generally transient. I have seen the same amelioration follow upon the administration of ether. I am not satisfied, however, that I have ever noted permanent advantages, although I have been twice nearly convinced.

The present fashion of the wholesale removal of teeth and tonsils for the cure of chronic arthritis, and more especially for the cure of the *osteo-arthritides,* will pass like many other fashions in dress and surgery, and the tombstones erected in the mouths of the multitude will remain gnashing and whitened witnesses of only the *dirty* and not of the *dangerous departed.* A holocaust of teeth and tonsils has been made in our experience, with a modicum of cures. "A very little bread for a whole lot of sack." We have rarely noted rapid cures after the sacrifice, and they have been rather in the more or less acute cases, where there was no bone involvement and not in the general class of hypertrophic osteo-arthritic cases, for which the removal of teeth and tonsils is nowadays usually made.

We think of a rather wide multiple arthritis involving the smaller joints with plus free fluid and marked bone atrophy, as being spirochetic in origin and probably of a congenital spirochectic origin.

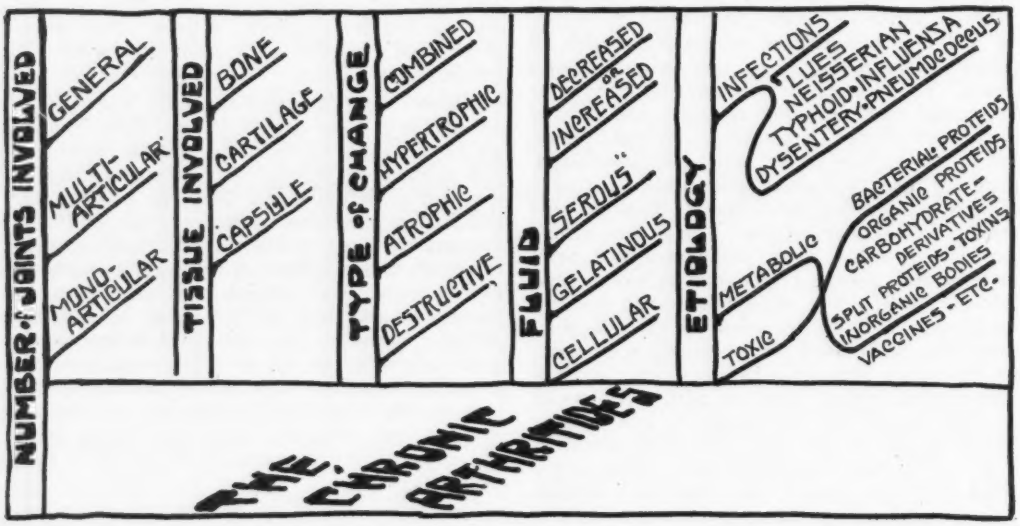
Another type involving the spine especially, although in a lesser degree also at times involving all of the joints of the body, tending to progression towards anchylosis, but without any especial spurring or bridging, we learn to associate very definitely with Neisser infections. A very acute monarticular or multiarticular type involving chiefly the larger joints, but with definitely destructive character, accompanied with great pain and tending to anchylosis, with more or less complete articular cartilage destruction, we believe is also gonococcic in origin. A particular subtype of this, generally involving many joints, clearing up perhaps in the majority, but leaving one or two more or less completely anchylosed joints, occurring often after parturition, is also generally gonococcic in origin.

Deformities appear in and around joints, not with especial reference to the bacteriological etiological character, but with particular reference to the changes in strain or balance. They are developed generally when the changes are not rapid, or the infection not fulminating, and the deformity has rather a specific character for each special joint, practically regardless of the etiological factor. This deformity is typical in definite proportion to the chronicity of the disease, and not with reference to the etiology of the disease. The usual reasons given for the peculiar character of the deformity, namely, that it depends upon the fact that certain groups of muscles are stronger than opposing groups of muscles, is a fallacy. A similar deformity occurs when the stronger group of muscles has been divided, destroyed, or changed. This may be easily noticed when a division of the flexor tendons of the wrist occurs as the result of an accident, the deformity resultant being a flexion deformity just as when the extensor groups have been divided; and the degree of the deformity is rather in proportion to the pain, suffering or infection subsequent to the injury than to the extent of the muscles divided. Very nearly the same

deformity occurs in a knee, which has been the seat of chronic tuberculosis; of sub-acute lues, of traumatic inflammation, or resultant of poliomyelitis paralysis, as occurs in a Charcot joint; that is, a flexion external rotation deformity with a tendency to backward displacement. In all diseases or injuries in or around joints, a certain typical deformity is likely to be produced, and this deformity is usually most characteristic as the change is less rapid and apparently does not depend upon the strength of the muscles involved in flexion, but rather upon the position towards which our early progenitors were instinctively driven under fear, threat, wound or pain, a position assumed probably by the fittest to survive as the best protection to their most vital organs. This is so, as we have said before, regardless of the comparative strength of the opposing groups of muscles. The same deformity occurs in the shoulder, where the deltoid and supra-scapular, aided by the muscles which elevate the shoulder, are the strongest muscles, after damage to the abductors as when the pectorals have been divided by a sword slash; the same pain, or fear of pain, and desire for protection, giving rise to a similar deformity in the joint, even when the joint itself is not damaged. We protest, therefore, against using any suggestion of an essential deforming influence in the nomenclature of joint diseases; making the result of the insufficiency of the surgical procedures to appear as a necessary part of the disease. We protest, therefore, unless we also use the terms poliomyelitis deformans, fracture deformans or Neisser infection deformans in joint deformities subsequent to these various conditions. Why capitalize our failures?

It is also to be noted that any deformity, having started with these varying etiological factors, has a very definite tendency to develop after the etiological factor has disappeared. The change in bearing surface and the lines of strain not only perpetuate and continually exaggerate the deformity, but also cause changes in the pathology just as similar changes in pathology and increases in deformity occur in a bridge or any other structure in response to altered strain and stress after local damage.

I would like at this time to discuss the relation existing or appearing to exist between traumatism and the various arthritides. Personally, I doubt that traumatism has any essential relation to arthritis as an etiological factor in any of the chronic types, and especially do I doubt it where the changes involve the bony structures and more especially so where the changes are widespread. As we all have seen, an injury to a joint of any particular severity is soon followed by an effusion into the joint. If the injury is not essentially structural this effusion is serous. If more severe, this serum is mixed with blood, or it may be at first composed entirely of blood. The sequence and progress is noted typically in the knee joint only, because in this joint the effusion is most evident. However, a similar synovitis, or arthritis with effusion, is produced in any other joint when subjected to a similar traumatism, although the contour of the joint often masks the evidence. I doubt that osteitis is engendered by injury to bone, excepting when the injury is of a sufficient degree to definitely alter the structure of the bone at the moment of injury, just as I would doubt alleged mechanical injury of other organs, the eye, cord, or skin, which did not show, directly subsequent to the injury, changes or evidence of changes in the structure alleged to be injured. I look askance when traumatism is alleged as the cause of changes in the skin of a hand when similar changes are evident in the skin of the foot, which has not been the subject of injury. It is, therefore, hard for me to believe that chronic osteitis can be the result of traumatism either when the structure of the bone remained unchanged directly as a result of that traumatism, as shown by good pictures, or other evidence of structural changes; or when similar changes, of more or less degree, are widespread throughout



the skeleton. It is my opinion that an injury, of sufficient degree to later produce osteitic changes, must have caused a rending or impaction of the bone and an effusion of blood in or around the bony structure at the moment of damage. There is no injury of structure, without effusion of blood, in tissues that have blood supply, and there can be no osteitic or periostitic changes solely as the result of a traumatic etiologic factor without definite evidence of such injury. The results of traumatism, when not definitely destructive, are recovered from more rapidly when the traumatism is light, more slowly when the traumatism is severe, but there is a very definite tendency to repair in traumatic changes in contradistinction to metabolic or degenerative changes. Effusion and changes in and around joints, in and around other deep structures, the same as effusion in and under the skin or in other superficial tissues, are generally soon dispersed when the result of traumatism alone. Bony changes are, however, more slow than changes in soft tissues, and repair from injury is correspondingly slow. Repair is completed, however, in just about the time proportion that healing takes place in flesh wounds as compared with bony wounds. When traumatic damage occurs in or around bone, whether it is in a vertebra or a phalanx, the effusion is generally either reabsorbed with the return of normal function, the same as after effusion in the subcutaneous tissue, or it is replaced by callus or by fusion of the structures. After a real fracture without displacement in sites easily observed and not diseased, there are no nodes, no bridging, no spurs, but definite callus leading to repair. Nodes, spurs, atrophies, hypertrophies, degenerative changes, therefore, are not evidences of repair of damaged bones or joints, but rather of diseased processes invading the bony structures. To talk of traumatism as a cause for the osteo-arthritides, without any clear idea of what the direct pathology of the traumatism was, is talking uselessly and thinking in a fog. As a matter of fact, we know, beyond the peradventure of doubt, when we see spurs involving perhaps a large area in the vertebral column subsequent to a recent injury, that they must have existed prior to that injury and that the injury played little and possibly no part in the etiology of their development. On the other hand, it is more than probable that traumatism is often responsible for the recognized inception of the symptoms. I use the term "recognized" here advisedly, believing that the traumatism is frequently the cause of the symptoms becoming acute enough to materially interfere with ready functions; that the patient honestly, perhaps, ofttimes believes the accident caused the pathology. More generally, however, it is solely the occasion of the physical recognition of the disabling symptoms, and the patient well knows that long previous to the accident he had to be more and more careful in his work, had to better protect himself in precarious positions, was growing more stiffened and was "feeling his age." The traumatism, then, cannot be considered as a primary cause of the disability in these osteo-arthritic cases, but only as a last straw that was laid on the camel's back that had long since been yielding to the load.

Treatment: The treatment of the common types of the chronic arthritides may be divided into *general* and *local.*

Dealing first with the general treatment—

Medical: This, of course, is directed to the etiological factors, when these can be determined; to the general etiological factors as well as to the specific.

Believing that personal cleanliness is of essential importance we have the patient *cleaned up.* We take care that the skin is well bathed, rubbed and kept warm and dry. The mouth is seen to, the teeth are kept clean; any infected, pus-bathed teeth, which cannot be properly cleaned and drained, together with all snags and stumps, are removed; tonsils which are foul are excised; dysenteries are, if possible, cleared up; piles, or rectal fissures, are taken care of; the bladder, vagina or sinuses, are put in as normal condition as possible. The bowels are opened, and digestion if necessary and possible, is improved. All these organs are looked over, swept and garnered; made and maintained *esthetically* as clean as possible, not generally with any idea of removing any specific focus or foci upon which the etiology of the disease depends, but rather to get the best possible hygienic surroundings as a preliminary to any effective procedure. We have earlier stated our opinion; that all the chronic arthritides, particularly the osteo-arthritides, are very definitely associated with, and materially modified, by many proteid bodies gaining entrance to the organism, whether they are or are not the direct products of bacteria; that other organic materials, more especially carbo-hydrate derivatives, act in a similar manner; that a great proportion of these cases are more probably *anaphylactic-like* than *bacterial-like;* and that whether involving the soft tissues, or the bone, are probably due to the tissue reaction to the specific agent. The matter of digestion is given particular attention. Toxins or any proteid body non-assimilable or difficult of assimilation, altered before or morbidly changed after ingestion in either the stomach or intestinal tract, derived perhaps from bacteria, which are considered non-pathogenic or even beneficial, act often with reference to the arthritides in a similar manner to bacterial poisons, which are considered pathogenic. It cannot, however, be said, in our opinion, that any special kind of food should be prohibited or crowded; starches and sugars perhaps are those most often offending. We cannot particularize, however, between red meats or white meats, or between fish and flesh or fowl. Generally speaking, however, I incline to the opinion that usually in the hypertrophic forms, meats should be somewhat limited, and vegetable proteids rather to be preferred to animal proteids. Many of these cases are or have been rather heavy feeders, with a predilection for meat foods. Generally speaking, therefore, we permit any food which is easily handled and digested, rather insisting upon a more generous, heavier meat diet in the anemic, atrophic types, and favoring some limitation and lessened meats or sugars in the

hypertrophic types, but considering the most essential feature of the food intake to be its ready digestibility and assimilation. It is hardly necessary in this connection to add that the usual laboratory examinations for digestion are often necessary to determine the degree of digestion. We cannot predicate any fixed rule for foodstuffs. We have some general ideas for certain classes of cases, but each case must be considered alone for diet. Sometimes, milk modified by some of the lactic acid bacteria, sometimes changed by the action of the yeast plant, is decidedly beneficial. At other times, and in apparently similar cases, it is decidedly detrimental. Not the character of the foodstuff, whether sugars, or proteids, or fats, whether meats or vegetables is of especial importance, but rather their ready and complete digestibility and handling in the animal economy. We find also that the fruit acids are often of considerable value, but these also are to be used with an eye singly to their ready transmutation. Generally speaking, they have definite advantages over the direct ingestion of alkalies, but at times the stomach will not handle them in sufficient quantity to make them of value. Under such circumstances alkalies are given direct, in such forms as chloride of calcium in vichy or some other alkaline water or sometimes better, one of the artificial alkaline waters, especially those which contain calcium salts. The salts of the vegetable acids are, however, to be preferred when readily tolerated. Iron and arsenic are generally given in some of the types, and arsenic, mercury and iodides in others. In the hypertrophic types, especially those occurring in people of the short back, plethoric shape and habit, colchicum, iodides, thyroids and venesection are ofttimes effective. Venesection is probably the one most effective measure in the more or less acute cases for the relief of pain and in our therapy as rapid as morphine and vastly more lasting. The letting of blood, by the by, ofttimes is a most effective measure in cases even not of the plethoric habit.

We look upon the matter of the relation between rest and work as of prime importance. It evidences bad judgment on the one hand to advise exercise or any actual work for acutely inflamed joints, when every movement increases pain, tenderness, spasm and swelling. On the other hand it is also bad judgment to favor complete rest for joints which are neither tender nor œdematous. Work within the limits of tolerance, work which does neither produce nor favor increased pain or spasm or œdema, is advisable and must be insisted upon. Work within the limit of tolerance in gradually increasing periods of time, with rest as nearly complete as possible, in a good functioning non-strained position in the interim is a good working plan.

Locally: When a joint is tender in any especial area cauterization and blistering are advisable; when it presents general tenderness, leeching, and especially when many joints are involved venesection is practiced. When there is dense and massive effusions around the joint (not free fluid in the cavity of the joint), it is often of value to inject mild citrate of soda solutions in the neighborhood of the effusions. These injections are painful, but definitely promote absorption of the exudate. Fibro-lysin has been used by us in just such conditions in many cases, where theoretically its value should be evident, but I am not satisfied that it has any value, certainly not any value to be compared to those advised. As soon as it is practicable a good functionating position is secured, for while use in a bad position with increased strain favors increased deformity, use in a functionating position is an ever welcome ally in the restoration of function.

While generally in tender joints we deplore movements which are accompanied with pain, nevertheless we do not hesitate to make any movement which is necessary to secure the position desired, using as much force as is required to accomplish this purpose. This is done in one or two seances, splinting for a few days after the movement so that the effects of the trauma may wear off. It is never forgotten that every movement which excites pain with generally resultant œdema, must be considered an injury and is to be deplored, but, after all, function is the desired aim, and function cannot be resumed in a non-functionating position. Believing also that the strain of a bad position promotes not only increased deformity, but also increased pathology, we, therefore, in deformity, even in painful joints, incur the guarded trauma, in order that strain shall be relieved and a useful position secured.

When, however, the joint under consideration is in the best possible position to resume function and assuming the extreme tenderness has abated somewhat, under the methods already discussed, we now take up the treatment for joint mobilization, for the removal of the remaining stiffness, effusion, pain and tenderness, for the repair of the long-disused muscles and the clearing up of the sometimes massive myosites, for the dissolution of the fascial œdemas and the coaxing of the skeletal organism to again take up, perhaps in a limited degree, their forgotten use:—to restore their forgotten function, is a statement well within the mark. One who has watched these cases, especially in those who, for years perhaps, have been heartsick with long-deferred hope, must have noticed the inability, after repeated attempts, to even get an impulse to a muscle group and then seen the limb lifted and the joint slowly moved, and noted the joy of the patient in the greater ease with which the muscular effort is made, is convinced that in addition to the pain, to the stiffness, to the paresis, to the deformity, there was also practically an entire forgetting of the co-ordinating path and muscle sense. At this stage massage, at the hands of a well-trained masseuse, carefully directed, is probably the best single means in our armamentarium. It is harmful to use massage, excepting mild effleurage, in the earlier stage when pain, spasm and tenderness are extreme and when splinting is the essential factor; it is futile to use it later when anchylosis has occurred excepting with the object of getting better muscular control of

the stiff limbs. Used at the essential moment, however, in a proper manner, carefully controlled, it is, I repeat, the best single means at our disposal. This argument, however, is no excuse for rough treatment, for unskillful handling, and especially not for the masseuse attempting to find painful spots and then bruising them. A good masseuse desires directions when wisely offered—a bad one may be known by her resentment of them. Good, careful work is desired. Good, efficient work of this kind is not equally secured by a ten weeks' trained university student, even when armed with a couple of well-kept and thumbed card indexes. The next best procedure is passive congestion—the well-known "Thomas dam," after the method of Thomas, of Liverpool. I have said *the best means and the next best means,* but far better than either is their combination, the massage beginning just after the peak of the congestion has passed. Care must be taken, and especial directions must be given, that the treatment must not provoke pain. Treatment must be given daily at first. Splinting should be at first continued at night, or for many hours daily if found necessary to prevent spasm or deformity.

General soreness during the course of treatment is combated with epsom salt packing; local tenderness with leeching and cauterization; local œdema and dense thickening with leeching or citrate of soda injections; the general weariness and heart soreness, with gentleness and persistence; discouragement and procrastination, with firmness and reassurance of improvement.

SKIN RASHES IN EXOPHTHALMIC GOITRE

By F. F. GUNDRUM, M. D., Sacramento

The purpose of this communication is first to report two cases which presented what is apparently an uncommon skin complication, and secondly to review very briefly the available literature upon skin rashes in Exophthalmic Goitre.

Case 1. Mrs. W. Age 36. Had had, since puberty, a very slightly enlarged, symmetrical thyroid, without symptoms, either during her two pregnancies, or at any other time. The patient's attention was attracted to her thyroid by comments of her friends. When she consulted me in 1919 her thyroid measured 5.5 cm. in horizontal diameter, and there were no unusual manifestations. In October, 1920, I was called to see her, because of violent itching. She was somewhat thinner than formerly, with a definite exophthalmos; pulse, 140; lid lag, marked tremor of hands, and intense itching. There was a discrete rash scattered over arms, body, and legs, most profusely over the legs, as high as the knees. This consisted of deep, pink, almost red macules, barely perceptibly raised, varying from the size of a pea to that of a quarter. They disappeared on pressure. There was no scaling, no weeping, and no edema. Never having seen such a rash associated with goitre, I gave cathartics and local antipruritics, without benefit. Dr. C. E. Schoff, who saw the patient with me, agreed that the rash was probably toxic, and we advised partial thyroidectomy, which was done. About two-thirds of the gland was excised by Dr. J. B. Harris. There was a marked exacerbation of rash upon the night following the resection. Upon the third post-operative day, the skin was clear. There has been no recurrence.

Case 2. Mrs. R. Consulted Dr. Harris because of a goitre, tremor, tachycardia, and loss of weight. Examination showed very slightly elevated macules, deep pink in color, in size varying from a pea to a dime. They itched "quite a lot." The distribution was symmetrical, and about ten were present upon each forearm, and twenty upon each leg. In this patient too, an exacerbation was had upon the day following operation. The rash disappeared on the fourth post-operative day. There has been no recurrence.

The dermatoses described in patients with exophthalmic goitre are many and various in appearance, pathology, and probably in etiology as well. Text books and available literature describe many skin conditions as occurring in exophthalmic goitre, but in the main, without classification or endeavor to correlate the skin pathology with the known physiological upsets, produced by an overacting thyroid gland; (3) (4) (5) (6) (7). J. du Castel (1) divides the dermatoses as follows:

(1) Vasomotor, such as hot flashes, dermatographia, edema, purpura;
(2) Trophic, such as melanonderma, vitiligo, scleroderma, alopecia;
(3) Toxic, such as urticaria, pruritus, erythema, etc.;
(4) Microbial, such as furunculosis, eczema, etc.

Hyde and MacEwen (2) make an effort to classify upon basis of etiology.

Their group 1 includes dermatoses of accidental concurrence such as acne, eczema, some urticarias, tinea versicolor, leukoderma, and pigmentations.

Group 2 includes dermatoses more or less distantly related to the essential morbid processes of goiter, such as hyperidrosis, urticaria, erythema, sudaminae, hidrocystoma.

Group 3 includes dermatoses intimately related to the morbid processes of goiter, such as scleroderma, edema, myxedema.

A goodly proportion of the skin rashes mentioned in the literature falls into Group 1 of this classification, and a still larger number into Group 2. In all probability most dermatoses described with exophthalmic goiter are no more than results of a hypersusceptibility to insult brought about through the moist, congested, and often slightly edematous condition of the skin. However, a small number of these skin conditions may be the direct results of the pathological thyroid physiology accompanying exophthalmic goiter.

The two rashes described above, apparently depend quite directly upon thyroid intoxication, they both flared up and then disappeared after partial thyroidectomy.

References

1. J. du Castel: Paris Medic., May 10, 1919.
2. Hyde & MacEwen: Amer. Jr. Med. Sciences, June, 1903, p. 1000.
3. A. Maude: Brain, 1894, p. 246.
4. S. E. Dore: Brit. Jr. Dermat., October, 1900, p. 353.
5. Burton: Lancet, London, September 22, 1888, p. 573.
6. Sabourand: Annals d. Dermat. et Syph., vol. IV, 1913, p. 140.
7. Chambers: Domin. Med. Monthly, February, 1903.

Capital National Bank Building.

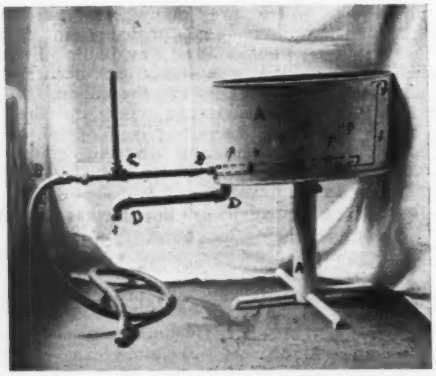
A USEFUL APPARATUS IN PHYSIOTHERAPY*

H. L. LANGNECKER, M. D., San Francisco and FRANCIS E. BOERKE.

Inasmuch as the essential equipment commonly used is complicated and expensive, the apparatus herewith illustrated and described has been devised to obtain a high temperature flowing areated bath

*From the Department of Physio-therapy, Stanford University Hospital.

as a necessary preliminary in the treatment of certain orthopaedic conditions where better movement of joints or the softening of scar tissue, et cetera, is desirable or indicated, especially in the distal portions of the upper extremity. Its practicability, simplicity and inexpensiveness makes it readily available and aids materially in acquiring better results in the treatment of this class of cases. For the past one and one-half years its usefulness has been frequently demonstrated in our department.



Description:—Conveniently shaped receptacle on adjustable stand (A-A), the supply pipe (B-B) attachable to water supply contains an areating valve (C) and terminates in a straight one-inch pipe, with perforations on its upper surface (B) extending across the bottom of the tank. Excess water is carried away by overflow pipe (D-D).

This arrangement gives an areated warm bath easily regulated as to temperature, force and activity of water.

County Societies

ALAMEDA COUNTY

At the monthly meeting on June 20, thirty members were present and 250 absent. The program consisted of:

1. Case Reports, by Florence Sylvester.
2. Immunization Against Diphtheria With Toxin-Antitoxin, by Ann Martin.
3. Static Defects of Feet in Children, by O. P. Stow.

These papers were discussed by N. A. Cary, Moffitt, Gompertz, Everingham, and Greig.

MENDOCINO COUNTY

The Mendocino County Medical Society met at Ukiah at the Langland Hospital, where a banquet was provided by the hospital management, Mr. and Mrs. S. B. Black and the Ukiah fraternity, on June 20. Dr. Petticord of Fort Bragg reported the State meeting; Dr. E. C. Griner gave a paper on Pain in the Abdomen; Drs. D. Smith and M. Rowe of the State Hospital gave a very helpful talk on mental conditions met by the general practitioner. There were thirteen members present.

Drs. M. A. and Chas. Craig of Lakeport were elected members of the County Society of Mendocino. They reside in Lake County, which has no county society.

SAN DIEGO COUNTY

The last scientific session of the Medical Society before its summer recess produced three excellent papers for discussion: First, paper on "Ileus," by B. J. O'Neill, M. D.; second, paper on "Dietetic Management of Diabetes," by R. A. Kocher, M. D.; and third, "Tics and Their Treatment," by T. Coe Little, M. D.

These papers were listened to by a large and representative gathering and called forth liberal discussion, in the face of which it seems almost a crime to close the scientific machinery during the summer months.

The local Medical Bulletin is carrying serially throughout the summer months intimate sketches of the early history of medicine in San Diego County. They make, not only enjoyable reading, but constitute a history of the times they represent that is extremely valuable to record and preserve. They are written by Dr. P. C. Remondino.

SAN JOAQUIN COUNTY

The regular meeting of the San Joaquin County Medical Society was held Friday evening, June 10, at the Chamber of Commerce quarters, Dr. R. T. McGurk presiding in the absence of the president. Those present were: Drs. R. T. McGurk, F. J. Conzelman, W. P. Lynch, L. Dozier, C. F. English, L. E. Tretheway, C. D. Holliger, L. Haight, J. V. Craviotto, H. E. Price, Grace McCoskey, Minerva Goodman, Hudson Smythe, A. H. McLeish, F. S. Marnell, G. J. Vischi, E. A. Arthur, J. F. Blinn, J. D. Dameron, Harry Cross, D. R. Powell.

Report was received from Dr. Dameron, as chairman of the Committee on Admissions, reporting favorably upon the names of Dr. E. L. Blackmun and Dr. F. J. O'Donnell. Thereupon the chairman declared Drs. Blackmun and O'Donnell duly elected members of the society.

The secretary announced the death of Dr. J. P. Sargent of Lodi, and it was moved, seconded and carried that the secretary convey the expressions of regret at his passing to the surviving widow.

Dr. F. J. Conzelman presented three very interesting cases of organic nerve lesions.

Dr. Harry Cross presented two cases of tuberculosis which were greatly improved by the method of treatment which he has instituted. Dr. Cross stated that he had treated 230 odd cases with his new preparation, and had had very satisfying results, but that he was not yet ready to divulge the nature of the preparation, excepting to state that in it he was able to give large doses of mercury without constitutional disturbances, and that the preparation had a selective action upon the tubercle bacilli. There was considerable discussion and numerous questions asked. The members of the society are very hopeful that Dr. Cross in the near future will be able to give more detailed information as to his methods and remedy.

Dr. T. G. Inman of San Francisco gave a very interesting talk on spinal cord conditions. By means of charts he demonstrated the effect on different nerve bundles in the spinal cord that lesions would have when located at various sites.

DOCTOR MOFFITT HONORED

Dr. Herbert C. Moffitt, clinical professor of medicine at the University of California Medical School, has recently been the recepient of exceptional and well-deserved honors. On June 23, his Alma Mater, Harvard University, conferred upon him the honorary degree of Doctor of Science. In conferring the degree President Lowell spoke as follows: "Herbert Charles Moffitt, professor of medicine at the University of California; the physician who built up for the University of California the great medical school of the Pacific Coast." At the last meeting of the American Association of Physicians Dr. Moffitt was elected president for the ensuing year, succeeding Dr. W. S. Thayer.

Book Reviews

Laboratory Manual of Pharmacology. By A. D. Bush. 251 pp. Illustrated. Philadelphia: F. A. Davis Company. 1919. Price, $3.50.

If the author's students actually use this book, they spend much more time with him than is given to the study of pharmacology in other medical schools.

The manual is an unusually complete one. A man who has worked his way through it will have a sufficient working knowledge of the more important drugs. It should be useful, not only to the author's students, but as a basis for laboratory courses in other medical schools.

L. E.

Accessory Sinuses of the Nose. By Ross Hall Skillern. 418 pp. 300 Illustrations. 3rd ed. Philadelphia and London: J. B. Lippincott Company. 1920.

This book is a particularly clear and comprehensive treatise on the subject and without question is one of the best in the English language. It gives in a clear and concise manner the anatomy, pathology and treatment of the various diseases of the sinuses; gives a very complete bibliography of those subjects which cannot be treated in detail, and gives references for statements made.

The first one hundred pages are given to general consideration which should be of great interest and value to general medical and surgical practitioners as well as being most worthy of the occasional reviewing by ear, nose and throat specialists.

H. A. F.

A Nurse's Handbook of Obstetrics. By Joseph Brown Cooke. Ninth edition. 468 pages. Illustrated. Philadelphia and London: J. B. Lippincott Company. 1920.

For any nurse who is specializing in obstetrics, it would be difficult to find a better book than this one.

The book is quite complete, not only in the essential details that a nurse should know, but also in interpreting the examinations of the physician, thus adding an absorbing interest to the whole picture. This is all told in simple, yet scientific, phrases so that the nurse is surprised at how much she can really know about the procedure of an obstetrical case.

It can be most enthusiastically recommended to the nurse, to the superintendent of nurses, and even to the physician giving lectures to nurses.

New illustrated colored prints have been added to this edition—also a chapter on prenatal nursing.

M. J.

Laboratory Manual of the Technic of Basal Metabolic Rate Determinations. By Walter M. Boothby, M. D., and Irene Sandiford, Ph. D., Section on Clinical Metabolism. The Mayo Clinic, Rochester, Minnesota, and The Mayo Foundation, University of Minnesota. Octavo volume of 117 pages with 11 tables and charts of explanation. Philadelphia and London: W. B. Saunders Company. 1920. Cloth, $5 net.

The book is a handy manual for the technician doing this sort of work. The technic is plainly and concisely set forth, and should leave no doubt as to a correct procedure. The tables are convenient and arranged in one manual will save considerable time for the worker. The clinician who would understand the chemistry underlying the basal metabolic rate of the body must turn elsewhere for his information. For this there is a very good bibliography appended.

D. M. E.

Radiography of the Chest. By Walker Overend. 119 pp. St. Louis: C. V. Mosby Company. 1920. Price, $5.

This book which is the first of two volumes on the roentgen examination of the chest deals entirely with pulmonary tuberculosis. It is concise and well illustrated. A commendable feature is the inclusion of a brief clinical history with each illustration. Perhaps too much space has been given to the subject of classification of pulmonary tuberculosis and too much emphasis laid on nomenclature to the exclusion of detail in descriptions of the roentgen appearances. Taken as a whole, the book will be found very satisfactory as an elementary exposition of the subject.

H. E. R.

Optimistic Medicine. By A Former Insurance Man. 318 pages. Philadelphia: F. A. Davis Company. 1921.

The author here tells not his name,
He keeps himself unknown to fame;
He's but an old insurance man,
Built on an optimistic plan.

Just what audience he would reach
With the things he has to preach,
'Tis hard to tell. We look in vain.
The preface does not this explain.

He takes about three hundred pages
To state that humans of all ages—
Infant and youth, adult and old—
By a physician must be told

How to live and what to eat
To reach old age with temper sweet;
How to avoid each ache and pain
Of the body and the brain.

His optimism is extreme,
That he should think or even dream
That doctors can prevent each ill
That strikes the body, mind, or will.

With anecdotes he illustrates
Quite frequently each point he makes.
Sometimes they seem quite apropos,
But then again they are not so.

It is not worth a doctor's while
To read a book writ in this style.
A layman won't assume the task.
"What audience?" again I ask.

A. L. F.

Surgical Clinics of North America. February, 1921. Volume 1, Number 1 (Philadelphia number). 259 pages. Published bi-monthly. Philadelphia: W. B. Saunders Company. Price per year, $12.

J. B. Deavor: Pancreatitis. **J. C. DaCosta:** Hydatid cyst of liver. Paget's disease of bones. Fracture of vault and base of skull, tear of dura, laceration of cortex, and hemorrhage from posterior branch of middle meningeal artery. Lethargic encephalitis mistaken for meningeal hemorrhage. Pulsating central sarcome of lower end of humerus. Presenile spontaneous gangrene. **J. G. Clark:** Prolapsus uteri; ultimate results in one hundred cases. **C. H. Frazier:** Clinical lecture on trigeminal neuralgia. **A. P. C. Ashhurst:** Birth injury of right shoulder, neurolysis of brachial plexus. Fracture of tibia: Open reduction. Recurrent posterior dislocation of hip following infantile paralysis, paralytic valgus of right, and calcaneovalgus of left foot. Cystic ovary. Umbilical hernia. Incomplete abortion. Hemorrhoids. Cellulitis of forearm and thigh. Open reduction of fracture of forearm (Dressing). Two cases of effusion into both knees: One syphilitic, the other hemophiliac. **J. H. Gibbon:** Amputation of breast for carcinoma; the Stewart incision. **C. F. Nassau:** Epithelioma of lip. **T. T. Thomas:** Method of applying extension with plaster cast fixation in fractures of leg. **J. H. Jopson:** Old fracture of patella. Treat-

ment by open operation, wiring of fragments, and suture of fascia and aponeurosis. Ectopic testicle: Perineal variety: Operation and implantation of testicle in scrotum. Primary hemangiomatour endothelioma of spleen. **G. P. Muller:** Large enchondroma of scapula of many years' duration; excision of tumor and scapula followed by local recurrences. Enchondroma of scapula and long bones. Chondro-osteoma of humerus in young boy. Multilocular cyst of lower jaw, treated by simple excision and followed by cure for a period of three years.

Anaphylaxis and Anti-Anaphylaxis and Their Experimental Foundations. By A. Besredka. 143 pp. St. Louis: C. V. Mosby Company. 1919. Price, $2.25.

Besredka must be considered the authority par excellence on the subject of desensitization or anti-anaphylaxis, as Victor C. Vaughan appropriately states in the preface to the American Edition of this monograph. It is not surprising to find, therefore, Chapter V of this small book to contain a vast amount of information which is of great practical value to those who are concerned in any form of treatment involving the use of serums, vaccines or the injection of proteins of any kind. The statements on food idiosyncrasies, tuberculin-allergy, etc., are clear and definite. As is well known the idea that the antibody-antigen reaction that causes the shock of anaphylaxis takes place in or upon the cells of the fixed tissues originated with Besredka, who believes that the reaction which determines the shock occurs in certain cells of the central nervous system. It may be remarked here that since, in the guinea pig, the rabbit and the dog, the pathological changes of anaphylaxis have been shown to occur independently of the central nervous system, the latter phase of Besredka's theory, which this author maintains in the monograph is evidently untenable. The theories relating to anaphylaxis are dealt with in Chapter VII. The specialist misses a number of important observations and probably desires a more detailed discussion of the various hypotheses, which have been offered to account for the phenomena of anaphylaxis and allergy.

The concluding Chapter VIII, "Recent Work on Anaphylaxis," by Dr. Gloyne, is excellent, and supplements in many respects the presentation of Besredka. As a whole it can be said that a complicated subject is explained in an attractive manner and this monograph should be consulted by all medical men, who have already made themselves familiar with the elements of this subject.

K. F. M.

Books Received—July, 1921

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for review in the interests of our readers and as space permits.

Surgical Clinics of North America. April, 1921. Vol. I, No. 2. Publisher, W. B. Saunders Co.

Typhus Fever With Particular Reference to the Serbian Epidemic. Publisher, Harvard Press University.

Intestinal Flora. By Rettger and Chaplin. Publisher, Yale University.

Allen Treatment of Diabetes. By Hill & Eckman. Publisher, W. M. Leonard.

Infections of the Hand. By Kanavel. Publisher, Lea & Febiger.

Roentgen Interpretation. By Holmes & Ruggles. Publisher, Lea & Febiger.

Diseases of the Skin. By Ormsby. Publisher, Lea & Febiger.

Nutrition and Clinical Dietetics. By Carter-Howe & Mason. Publisher, Lea & Febiger.

Evolution of Disease. By Danysz and Rackemann. Publisher, Lea & Fabiger.

Medicine Before the Bench

In this column from time to time will appear comments on court decisions and proceedings affecting public health laws, physicians and surgeons, the conduct of hospitals, laboratories, X-ray and all the agencies of modern medicine.

LEGAL LIABILITY FOR TRANSMITTING INFECTION

Both civil and criminal courts have recently rendered decisions declaring that the transmission of venereal disease lays the offender open to criminal and civil action.

In Oaklahoma a man has been sentenced to five years in the penitentiary for infecting a girl with syphilis. In Nebraska the court upheld a doctor who warned a hotel keeper that one of his patients, a guest at the hotel, had syphilis and had refused treatment and was consequently a menace to the public health. In North Carolina a woman has been awarded $10,000 damages against her husband for a similar infection, and the Supreme Court has upheld the judgment.

The Nebraska case is important because it asserts that a physician's duty to protect the public health may, under certain circumstances, transcend his duty to hold his patient's confidence inviolable. The North Carolina case is also important because it sets aside in this particular case the legal barrier that prevents a wife from testifying against her husband and bringing suit against him.

All three cases are valuable in counteracting incorrect statements, often made, that the venereal disease law falls almost exclusively on women and lets men go free. State laws, of course, govern in all such cases, but the fact that every State in the Union has now adopted many, if not all, of the venereal disease laws, gives ground for expecting similar action in other States. Certainly the wide dissemination of the three decisions should go far to curb diseased persons who deliberately expose others to infection.

Curiously enough, the District of Columbia is the only part of continental United States that has no venereal disease laws. Congress, which makes the laws for the district, has not yet acted.

The fact that the North Carolina decision makes it likely that marriage will henceforth be no adequate defense against a suit for transmitting infection will probably hasten the adoption by the States of laws requiring every applicant for a marriage license to present a certificate by a reputable doctor certifying that he is free from venereal disease and providing that without this no license shall be issued.

Twenty States have already adopted laws forbidding persons with venereal disease to marry; seven of these—New Hampshire, New Jersey, North Carolina, Oregon, Washington and West Virginia—having acted during the present year's sessions. Similar bills are now pending in several States.

All of the twenty States do not require medical examination and certification that the applicant is free from venereal disease. "Such certificate should be required in every State," insists the Public Health Service. "Any decent man with an uncured infection who marries does so either because he does not realize the seriousness of his action or because he believes that he is cured. The necessity for an examination should bring its seriousness home to him and should be welcomed by him as a protection for his wife and children. No real man should object to a medical examination required by law."

Of course those that hold the thought that disease is non-existent and those that believe that thumping the spine is the proper procedure demur to these decisions recently rendered.

DECAYED TEETH AND CHILDREN'S DISEASES

That decayed teeth are very strong predisposing causes to the "catching" of measles, scarlet fever, pneumonia, mumps, and other childish diseases is strongly urged by the U. S. Public Health Service, which cites very considerable reductions in those diseases in cities where dental clinics have been established in the schools. At Bridgeport, Conn., for instance, diphtheria has been lessened 8 per cent. At an orphanage in Boston these diseases, which had annually afflicted about one-third of the 325 inmates, practically disappeared after eight months' dental work. The absorption of pus from rotting teeth had weakened the children and made them easy victims to disease germs, and the cleaning up of this increased their powers of resistance.

NEW PUBLIC HEALTH SERVICE HOSPITALS

Washington, May —. The hospital program of the U. S. Public Health Service is moving rapidly. Nine new hospitals, which will accommodate more than three thousand patients, are now being put into shape for early occupancy. Three of these, in Iowa, Montana, and Oregon, with a capacity for about five hundred patients, should be in operation within two months. Others will not be ready for a longer time. Especially will this be the case with three Army reservations, two of which had been abandoned for ten to twenty months, which were specifically transferred to the Service by Act of Congress.

The Colfax hotel, at Colfax, Iowa, a leased building with 130 acres of grounds, is being fitted to receive two hundred patients. The Army hospital at Fort William Henry Harrison, near Helena, Mont., will be opened with one hundred general patients, but may later be greatly expanded. Additional money will be necessary to fit the buildings at Dawson Springs, near Hopkinsville, Ky., for maximum usefulness; but the necessary funds are expected to be forthcoming and the hospital to be opened with five hundred tuberculosis patients within five months. The Hahnemann hospital, at Portland, Oregon, should be ready for 164 general patients by July 1, and the Speedway Hospital, at Chicago, for one thousand general patients by August 1.

Of the three Army posts specifically turned over by Congress, that at Fort Walla Wallla is attractively situated near Walla Walla, Wash., on a low plateau near the junction of the fruit and wheat belts. The post has been abandoned for a year and, except for two brick barracks, its buildings are in bad condition and must be rebuilt. It will shelter 284 tuberculosis patients.

Fort McKenzie, one mile northwest of Sheridan, Wyo., is pleasantly situated against a northern shield of mountains. Its brick buildings surround a fine parade ground, once planted with trees, which, however, have suffered severely from lack of irrigation since the post was abandoned. Most of the region is sparsely timbered.

The red brick buildings of Fort Logan H. Roots, near Little Rock, Ark., stand on a bluff overlooking the Arkansas River. During the war some temporary wooden buildings were erected, but most of these have been removed.

Fort McKenzie and Roots are each planned to accommodate more than six hundred nervous-mental cases. Each of the three posts is likely to be ready in less than six months.

A naval station, at Gulfport, Miss., has just been taken over from the Navy by the Public Health Service and will be utilized as a hospital or home either by the Service or by some other branch of the government.

SPARE THE OX

According to a bulletin just issued by the U. S. Public Health Service, a French investigator has discovered that the malaria mosquito prefers cattle to human beings and will feed on them whenever she can, thus materially reducing the human malaria rate in several parts of France. He suggests fitting up stables as gigantic mosquito traps with cattle for bait. Here's a chance for the anti-vivisectionists and anti-vaccinationists to start a movement under the slogan, "Spare the ox; let the mosquito bite your own child."

Commission on Milk Standards

UNITED STATES PUBLIC HEALTH SERVICE

The number of bacteria in milk depends on dirt, temperature, and age, says the United States Public Health Service. Specific disease bacteria are not often present, and the difficulty of detecting them by laboratory methods renders these of little value in guarding milk against specific disease. The only practical safeguard is by medical, veterinary, and sanitary inspection and by pasteurization.

Bacterial counts indicate the safety and the "decency" of milk. Small numbers of bacteria indicate fresh milk, produced under clean conditions and kept cool; large numbers indicate dirty, warm, or stale milk.

Bacteria in milk are related to infant mortality. Children fed on milk containing few bacteria show a lower death rate than those fed on milk containing many. Bacteria harmless to adults may cause infant diarrhea, and milk containing large numbers is apt to contain species capable of setting up intestinal inflammation in infants.

In making the counts the methods of the American Public Health Association Laboratory Section should be used. Extensive study justifies the conclusion that bacterial analyses of duplicate samples of milk by routine methods in different laboratories vary about 28 per cent. Tests of five samples will give fairly accurate results and will always permit any milk to be accurately graded. At least four of the five should show fewer bacteria than the maximum allowed for the grade awarded. Grading should never be based on a single sample.

The grading of milk by the bacterial tests greatly modifies milk inspection by public health officials. Bacterial tests should precede dairy inspection, for they will point the way to insanitary milk. The milk inspection service should be reorganized, and it and the laboratory service co-ordinated under one head.

The Commission on Milk Standards, which was established in March, 1911, by the New York Milk Committee, a voluntary organization, consists, at the present time, of seven public health officials, six bacteriologists, four chemists, and two agricultural experts.

Notices

SECTION ON ORTHOPEDIC SURGERY

The Council of the State Medical Society has approved the establishment of a Section on Orthopedic Surgery and has appointed for the first year's work of this section, Dr. W. W. Richardson of Los Angeles, chairman, and Dr. G. J. McChesney of San Francisco, secretary. In the 1922 program special time will be allotted to this section. Members interested in presenting papers should correspond with either Dr. Richardson or Dr. McChesney.

SECTION ON OBSTETRICS AND GYNECOLOGY FOR THE COMING STATE MEETING

In the past years we have lost some very valuable discussions owing to the failure to employ a meeting stenographer. Furthermore, resolutions passed at various meetings have been forgotten because they were not properly recorded. If those who are interested in this section will contribute a small sum of $5 we shall be able to have a stenographer at our next meeting and perhaps will be able to provide mimeographed copies of the discussions.

I, therefore, call on those who wish a strong Section of Obstetrics and Gynecology to help us to make a success by mailing a check to the Secretary of this Section.

DR. L. A. EMGE,

Stanford University Hospital, Sacramento and Clay Streets, San Francisco, Calif.

PACIFIC COAST ORTHOPEDIC ASSOCIATION

The Pacific Coast Orthopedic Association was organized on May 13, 1920, with charter members from California and Washington. A constitution and by-laws was adopted. Dr. Harry M. Sherman (deceased) of San Francisco was elected president of the association, Dr. M. C. Harding of San Diego was elected vice-president, and Dr. Thomas A. Stoddard of San Francisco, secretary-treasurer. In order to become a member of this association, it is necessary that the physician limit his practice to orthopedic surgery, and that his application be accompanied by a thesis on some orthopedic subject, showing either original work or special work or a critical review of literature on an orthopedic problem.

NARCOTIC LAW

The following letter from the Assistant Prohibition Commissioner to John L. Flynn, Acting Director of Internal Revenue, suggests a legitimate way by which physicians may dispose of excess stocks of narcotics:

"Receipt is acknowledged of your letter of May 31, 1921, in which you state that quite a few druggists with Class 3 and Class 5 licenses, and some physicians registered in Class 4, are coming into your office 'with large stocks of inventories which they wish to reduce.' They desire to give part of their narcotic drugs to some charitable institutions, there being several of these which are registered in your office, among which are the San Francisco Tuberculosis Clinic, The Little Sisters of the Poor, King's Daughters and the Pacific Hebrew Home for Aged. Some of these institutions have asked you if it would be permissible to take over the narcotics donated to them by attaching an affidavit to the original order form, stating the purpose for which the narcotics are obtained, and that no financial consideration of any kind enters into the transaction, this affidavit to be kept on file with the duplicate order forms kept in the narcotic records of the institution.

"In reply you are advised that such narcotic drugs would apparently constitute excess stock, and this being the case, it is the opinion of this office that a physician desiring to dispose of such excess stock by giving it to a duly registered charitable institution may, under the provisions of T. D. 1199, dispose of same by a single sale (or gift), pursuant to an order form, to the institution without thereby incurring additional liability under the Harrison Act. The original order form should, of course, be preserved with the physician's narcotic records and the duplicate order form with the institution's records for a period of two years to show the disposition of the drug."

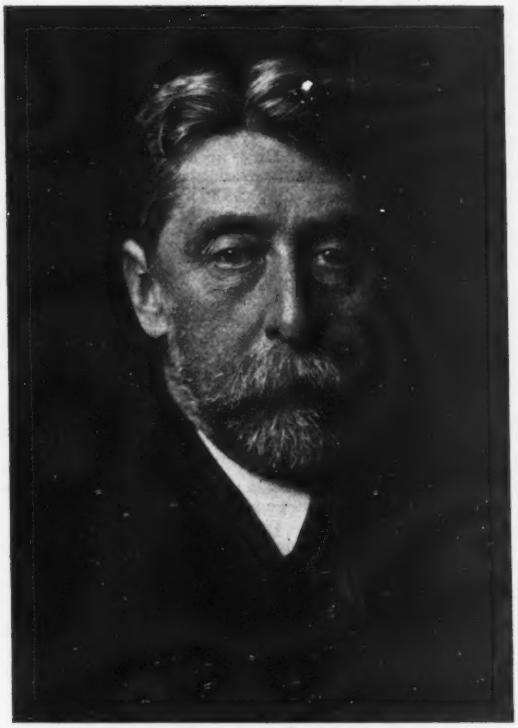
THE CALIFORNIA STATE HOMEOPATHIC MEDICAL SOCIETY

The forty-fifth session of the California State Homeopathic Medical Society was held at the Hotel San Rafael on May 11 and 12, and concluded at Hahnemann Hospital, San Francisco, May 13. The following officers were elected for the ensuing year: President, Dr. H. L. Shepherd; first vice-president, Dr. J. H. Buffum; second vice-president, Dr. Lillie Boldemann; secretary, Dr. Guy E. Manning; board of directors—Drs. Wm. Boericke, J. W. Watd, Sidney Worth, George H. Martin and A. K. Crawford.

New Members

Dr. Adolph Gottschalk, San Francisco; Dr. W. C. Hobdy, San Francisco; Dr. J. R. Masterson, San Francisco; Dr. Margaret Schulze, San Francisco; Dr. Evan C. Mills, San Francisco; Dr. M. H. Hirschfeld, San Francisco; Dr. L. E. Hardgrave, San Francisco; Dr. George A. Gray, San Jose; Dr. Harry E. Peters, Pittsburg; Dr. Edgar Holm, Eureka; Dr. J. Walter Kean, Los Angeles; Dr. W. T. Jamison, Pacific Grove; Dr. J. M. Colburn, Riverside; Dr. Benj. J. Edger, San Francisco; Dr. H. S. Chapman, Stockton; Dr. Jewel Fay, Livermore; Dr. John W. Bardill, Holtiville; Dr. E. D. Craft, Los Angeles; Dr. William A. Clark, Pasadena; Dr. Robert A. Stanton, South Pasadena; Dr. H. M. Hall, Los Angeles; Dr. Arnold E. Saverien, Los Angeles; Dr. Edwin M. Clinton, Los Angeles; Dr. R. V. Graves, Fullerton; Dr. M. H. Heldman, Fullerton; Dr. Judson H. Cole, Anaheim; Dr. Camillo, Barsotti, San Francisco; Dr. Stuart C. Way, San Francisco; Dr. Jerome D. Wirt, San Francisco; Dr. A. H. Rosburg, San Francisco; Dr. Herlwyn R. Green, Palo Alto; Dr. George W. Goodale, San Francisco; Dr. A. O. Eckhardt, Downieville; Dr. A. W. Kimball, Williams; Dr. R. M. Moose, San Bernardino; Dr. E. A. Crokat, East San Diego; Dr. F. L. Clemens, San Diego; Dr. L. B. Oliver, Chula Vista; Dr. W. O. Weiskotten, San Diego; Dr. E. N. Young, San Diego; Dr. George McKenzie, Concord; Dr. J. M. Ward, Oakland; Dr. Edward Purcell, Oakland; Dr. S. A. Lockwood, Oakland; Dr. E. M. Lundegaard, Oakland; Dr. L. L. Sherman, Oakland; Dr. Horace B. Dean, Weimar; Dr. Alfred A. Gumbiner, Los Angeles; Dr. John A. Leas, Los Angeles; Dr. William A. Strole, Los Angeles; Dr. Salvatore R. Monaco, Los Angeles; Dr. J. T. Edward, Pasadena; Dr. M. C. Terry, Los Angeles; Dr. I. Leon Meyers, Los Angeles; Dr. Cortland Myers, Los Angeles; Dr. Frank D. Coleman, Los Angeles; Dr. J. W. Farrell, Los Angeles; Dr. F. F. Thompson, Los Angeles; Dr. William B. Wright, Los Angeles; Dr. T. C. Lyster, Los Angeles; Dr. Julian N. Dow, Los Angeles; Dr. Mary B. Poket, Hamilton City; Dr. William D. Sansum, Santa Barbara; Dr. Franklin Nuzum, Santa Barbara; Dr. Hugh F. Freidell, Santa Barbara; Dr. Charles F. Mills, Atascadero; Dr. L. M. Pulsifer, Davis; Dr. W. H. Heuschele, Santa Clara; Dr. E. M. Miller, San Jose; Dr. Thomas K. Bowles, Modesto; Dr. George E. Hall, Palo Alto; Dr. L. J. Schermerhorn, San Francisco; Dr. A. H. Rankin, San Francisco; Dr. E. Blanche Ramer, San Diego; Dr. C. M. Vanderburgh, Fresno; Dr. Walter H. Sullivan, Sausalito; Dr. Chester A. DeLancey, San Quentin; Dr. S. B. Hewitt, San Francisco; Dr. Sidney Reiser, San Francisco; Dr. Caroline Cook Coffin, Oakland; Dr. Sherman Tuttle, San Francisco; Dr. Otto Barkan, San Francisco; Dr. John C. Williams, San Francisco; Dr. Davis Grisso, San Francisco; Dr. F. J. Carlson, San Francisco; Dr. A. E. Benner, San Mateo; Dr. James B. Bullitt, San Jose; Dr. W. N. Finney, Concord.

Obituary



AN APPRECIATION OF HARRY MITCHELL SHERMAN

By DOUGLASS W. MONTGOMERY.

Harry Mitchell Sherman has passed away, and it is now thirty-five years since I first knew him. I say "knew" rather than "met" because, from the first, we were intimately associated, and I grew to know him very thoroughly as the years passed by. There is an old French saying, "Il faut tres longtemps pour faire le tour d'un homme," and during these years of active professional life I made the circuit of him fairly frequently, and found no unlovely or mean spots in him. If I can tell the truth about him it is all that I ask, as the truth without embellishment is the most interesting thing that can be produced.

Although Dr. Sherman's father had resided in San Francisco in the very early days, and his uncle, William Sherman, had been master of the Mint, he arrived here a comparative stranger, and had no easy time during the first months of practice. He was fortunate, however, to become associated with George Chismore, one of the most efficient, kindly, humane men I ever knew. He was also fortunate in acquiring the orthopedic work in the Children's Hospital, which was then a very modest institution, located in two frame buildings on Thirteenth Street, near Folsom. He soon made this the chief orthopedic center in San Francisco. What an energetic individual he was then to be sure, with his large, powerful frame and his quick step!

Sherman's manner, whole bearing and voice are best described as being those of a grand seigneur. His manner was always nervous and high strung, without, however, a trace of weakness. He impressed one as driving himself, and one felt he would be lonely if he ever gave up the job. Alphonse Daudet speaks of the radiance of those who go cheerfully to their work, and it was even so with Sherman. His grand ways, his absorption, and at times his apparent neglect of those surrounding him were, however, something quite different from conceit or vanity, and never bore the marks of being in any way assumed or of conveying an ulterior meaning. They were as natural to him as any feature of his face, and they manifestly had the substantial backing of a fine character, an integrity that was sometimes too uncompromising and that amounted to a peculiarity, and accomplishments far above the ordinary. Sweeter to me than any music was the sound of that lofty, rather muffled voice with a nuance of affection in it, as I heard it, possibly on the street or in a crowded room. It was the voice of a friend in a world where, from the nature of things, true friends must necessarily be scarce. A most unselfish friend, who never required anything but friendship in return.

Some time after Sherman's arrival in San Francisco a number of medical men, including himself, George Chismore, Henry Ferrer, John F. Morse, J. D. Arnold, A. P. Whittel, W. S. Whitwell, R. I. Bowie, C. A. von Hoffmann, W. W. Kerr, Martin Regensburger and myself constituted what was informally called the Friday Evening Club. Out of this association there developed the San Francisco Polyclinic, of which Sherman was for a long time secretary. He worked hard at this task, and it was a heavy one. I can see him yet, sitting bolt upright, evening after evening, writing all the correspondence in his swift flowing, perfectly legible hand; he had neither amanuensis nor typewriter. All this time he, together with Charlotte Blake Brown, contributed the main force which drove forward the Children's Hospital.

When San Francisco was visited by the plague there was much confusion of tongues owing to the many commercial interests involved. As in all such questions, if the full truth is known, adjustments take place which are almost invariably advantageous to everyone concerned. Dr. Sherman was one of those who undertook to enlighten the public so that these adjustments might be brought about, but the public was an unwilling listener. At a public meeting at which he spoke he appended the following characteristic remark: "The smallness of the audience indicates that the people are either indifferent or inimical to the present campaign. It, therefore, shows, not that we should cease or slacken our efforts, but rather that we should more vigorously continue them until everyone is aware of the facts." This is the kind of spirit which would save a community from itself. The city did finally realize that it was better to solve the problem than to evade it, and the correct solution has been of infinite benefit to this community as a whole, irrespective of persons. Truly the rain falls on the just and on the unjust alike.

From the Polyclinic he passed into the University of California, taking the Chair of Surgery. Here he worked with his accustomed energy, and was an appreciated teacher, as he already was an accomplished writer. The earthquake came, and everything was considerably tumbled about, but instead of decreasing his exertions, he increased them. He assembled the faculty almost immediately at a meeting in his home, and organized a campaign for construction. The medical buildings, which had been devoted solely to laboratory work and to lecturing, were changed by him into a hospital. Under the disturbed conditions, this was an arduous and difficult task. Having accomplished it, however, he, at great personal sacrifice, urged his own private patients to enter there, while a number of his colleagues were quartering theirs in a much more commodious and more accessible private hospital.

In the year 1913 his connection with the Uni-

versity of California was severed. One of the main reasons for this severance was that he had by his personal exertions made the position an enviable one. One thing certain is that it was not because of inactivity on his part, as he was then working at his height in writing and lecturing, and in his public and private practice. It was after this that he strove, successfully, to enlighten the public on the nature of tuberculosis, the only way to combat this insidious disease. And it was long after this that he worked in the same way on the cancer problem, and with the same enthusiasm and success, and he brought to both these questions an exceptional gift of exposition.

But Dr. Sherman was one of those who cannot live by bread alone; an ideal was as necessary for him as the air he breathed. He was a charter member of the College of Surgeons, a body representing the best elements in this division of our profession in North America. Among its ideals was that each should strive to enlighten the public in regard to the great maladies, such as tuberculosis, syphilis and cancer, which cause so much misery and destruction, and in which, if properly understood by the commonality, so much may be accomplished to control or to mitigate. These subjects, together with his hospital work, chiefly in St. Luke's Hospital, afforded an outlet for his untiring energy. In fact, his private work represented only a small part of his activities.

When the war came he was indefatigable in work among the troops, and finally received a commission in the Medical Corps, and was honorably mustered out on the cessation of hostilities. It was during his army service that he contracted a severe influenza that, as a remote consequence, caused his death.

He was peculiarly fitted for this army work because of his expertness in orthopedic surgery which was the work of his youth. He was the dean of the orthopedists on the Pacific Coast and facile princeps. I well remember at a dinner of the University of Columbia Alumni, given after his return from service, listening to one of his lucid, delightful, profitable talks on his work in camp.

But you will say, "What reward did he have for all this labor?" It can be answered that he had much. Being so interested in his work and so busily engaged in it, he had no time either to become dull and introspective or to do evil to his neighbor. One might associate for days with Dr. Sherman without hearing from him an ill-natured remark, or the expression of an ignoble thought. This escape from our chief enemy, ourself, is one of the great, inestimable rewards of a busy life, spent in the pursuit of worthy aims.

Harry Mitchell Sherman has passed away, but his deeds have not passed away, and his individuality remains among us. The encouragement for us, in contemplating his life, lies in the fact that he did not exist for himself alone, rather that he was a fine type of a fine race. He was honorable, but can anyone who knew him imagine him as being anything else? What was true of this moral trait ran through the entire fiber of the man; he was what he was, not so much because he willed it, but because he could not be anything else. There are those that are of the earth, earthy, and are born to corruption, and there are those born with a living spirit, and surely this is what Saint Paul meant.

Deaths

Armstrong, John M. Died in Pasadena, California, April 23, 1921. Age, 64. Was a graduate of University of Michigan, Ann Arbor, 1885. Licensed in California, 1895.

Hay, Rilla Grafton. Died in Los Angeles, California, April 7, 1921. Was a graduate of Iowa State University, Iowa. Licensed in California, 1879.

Hubbard, B. Roswell. Died in Los Angeles, California, June 11, 1921. Was a graduate of Eclectic Medical Institute, Cincinnati, 1879. Licensed in California, 1901.

Kenyon, Frank P. A graduate of Detroit Medical College, 1876. Licensed in California, 1907. Died in Pomona, California, May 8, 1921. Was a member of the Medical Society, State of California.

Lillie, William A. Died in Monterey, California, June 21, 1921. Was a graduate of Bellevue Hospital and Medical College, 1895. Licensed in California, 1895. Was a member of Monterey County Medical Society.

Oliver, Leonard Briggs. A graduate of University of Iowa, 1887. Licensed in 1920. Died in Chula Vista, California, June 10, 1921.

O'Reilly, E. F. Died in Lancaster, California, March 16, 1921. Was a graduate of University of Southern California, 1914. Licensed in California, 1914.

Newkirk, Garrett. Died in Pasadena, California, April 7, 1921. Was a graduate of Rush Medical College, 1868. Licensed in California, 1901.

Swancott, John, of Los Angeles. Died March 9, 1921. Age, 27. Was a graduate of the College of Physicians and Surgeons, Los Angeles, 1917.

Teubner, Charles. Died in Oxnard, California, June 9, 1921. Age, 65. Was a graduate of University City of New York, 1885. Licensed in California, 1888.

Walker, Frederick Earl. Died in Long Beach, California, April 24, 1921. Was a graduate of University of Iowa, 1898. Licensed in California, 1915. Was a member of Los Angeles County Medical Society.

West, Eugene Francis. Died in Felton, California, June 8, 1921. Was a graduate of California Medical College, California, 1889. Licensed in California, 1890.

Woodin, Irving. Died in Los Angeles, May 10, 1921. Age, 69. A graduate of Long Island College Hospital, New York, 1874. Licensed in California, 1883.

Harris, Bartlett Y. Died in San Francisco, June 5, 1921. Was a graduate of the College of Physicians and Surgeons, Chicago, Ill., 1888. Licensed in California, 1888.

Kilbourn, Harvey B. A graduate of Jefferson Medical College, Pa., 1879. Licensed in California, 1886. Died June 4, 1921, in San Francisco. Age 74.

Lain, Elizabeth. Died in Santa Rosa, May 17, 1921. Was a graduate of Hahnemann Hospital College, San Francisco, and College of Physicians and Surgeons, 1897. Licensed in California, 1897. Was a member of the Medical Society, State of California.

Pace, H. L. Died in Chicago, Ill. Was a former resident of Tulare, Cal. Graduated from Missouri Medical College, 1890. Licensed in California, 1890.

McKee, James A. Died in Sacramento, Cal., April 20, 1921. Was a graduate of Rush Medical College, 1886. Licensed in California, same year. Was a member of the Medical Society, State of California.

Moss, J. Mora. Died in Washington, D. C., April 24, 1921. Was a graduate of Cooper Medical College, California, 1894. Licensed in California, 1895. Was a major in the Army, and a member of the Medical Society, State of California.

Topp, Thos. M. A graduate of Chicago Homeopathic Medical College, Ill., 1897. Licensed in California, 1898. Died in Truckee, Cal., March 17, 1921.